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ROSE CHEMICAL PROJECT
HOLDEN, MISSOURI
SITE INVESTIGATION
PRELIMINARY SITE ASSESSMENT REPORT

JULY 31, 1987

for

Clean Sites, Inc.
1199 North Fairfax Street
Alexandria, Virginia 22314

by

John Mathes & Associates, Inc.
210 West Sand Bank Road
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40024185
SUPERFUND RECORDS

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JOHN MATHES AND ASSOCIATES, INC.
210 W. Sandbank Rd.
Columbia, IL

JULY/87/0091s

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1 EXECUTIVE SUMMARY

John Mathes & Associates, Inc. (Mathes) was contracted by Clean Sites, Inc. (CSI) to perform a site investigation and preliminary site assessment at the Rose Chemical Facility in Holden, Missouri. Data from sampling performed prior to Mathes' involvement showed that the on-site surface soils contained varying levels of polychlorinated biphenyls (PCBs). The Mathes field investigation conducted in June and July, 1987, consisted of the following activities:

- Shallow soil sampling to assess the magnitude and extent of contaminant migration in shallow soils across the site (25 locations) and under the Main Warehouse floor slab (seven locations)..
- Geologic test drilling at three locations to a depth of approximately 50 feet to preliminarily define the geologic stratigraphy and structure at the site;
- Installation of three shallow (top-of-bedrock) and three deep bedrock groundwater monitoring wells;
- Collection and analysis of groundwater samples to preliminarily assess the on-site groundwater quality; and,
- Surface geophysical investigation to assess both the general potential for on-site burials and to evaluate specific suspected burial areas.

Data and information collected during this investigation was evaluated by Mathes to preliminarily assess the geology, surface and subsurface hydrology, and potential contaminant migration at the site.

The shallow geologic sequence at the site consists generally of approximately 15 feet of clay and/or shale residuum overlying alternating beds of primarily shale and limestone.

Groundwater was encountered in both the overburden soils and in the bedrock. These geologic materials have very low permeabilities as evidenced by lab permeability tests (approximately 10^{-8} cm/sec), in-situ aquifer permeability tests (approximately 10^{-4} cm/sec), and the slow recovery of water levels in the wells after drilling. The primary occurrence of groundwater is in the geologic material immediately overlying bedrock. It is probable that this bedrock surface, in conjunction with the ground surface, both sloping to the southwest, controls shallow groundwater flow.

Volatile organic compounds (VOCs) and PCBs were detected in soil samples obtained from under the Main Warehouse floor and from soil borings in the vicinity of the Main Warehouse. The vertical extent of contamination under the Main Warehouse floor is not known.

Evaluation of the analytical data from the shallow soils outside the Main Warehouse indicates that the PCBs and VOCs are likely confined to the upper 20 inches of soil across the site. The low permeability of the clay soils on-site and the low solubility of the PCBs and VOCs will act to retard the migration of these chemical compounds.

No PCBs or VOCs were detected in any of the groundwater samples.

Surface geophysical surveys by Mathes and Mathes' subcontractor (Neponset) indicate that the subsurface disturbed area west of the Main Warehouse loading dock contains at least three apparent drums. The surveys also indicate that no other large areas of subsurface disturbance (burial, trenching greater than 50 feet in length) have occurred in the open areas on-site.

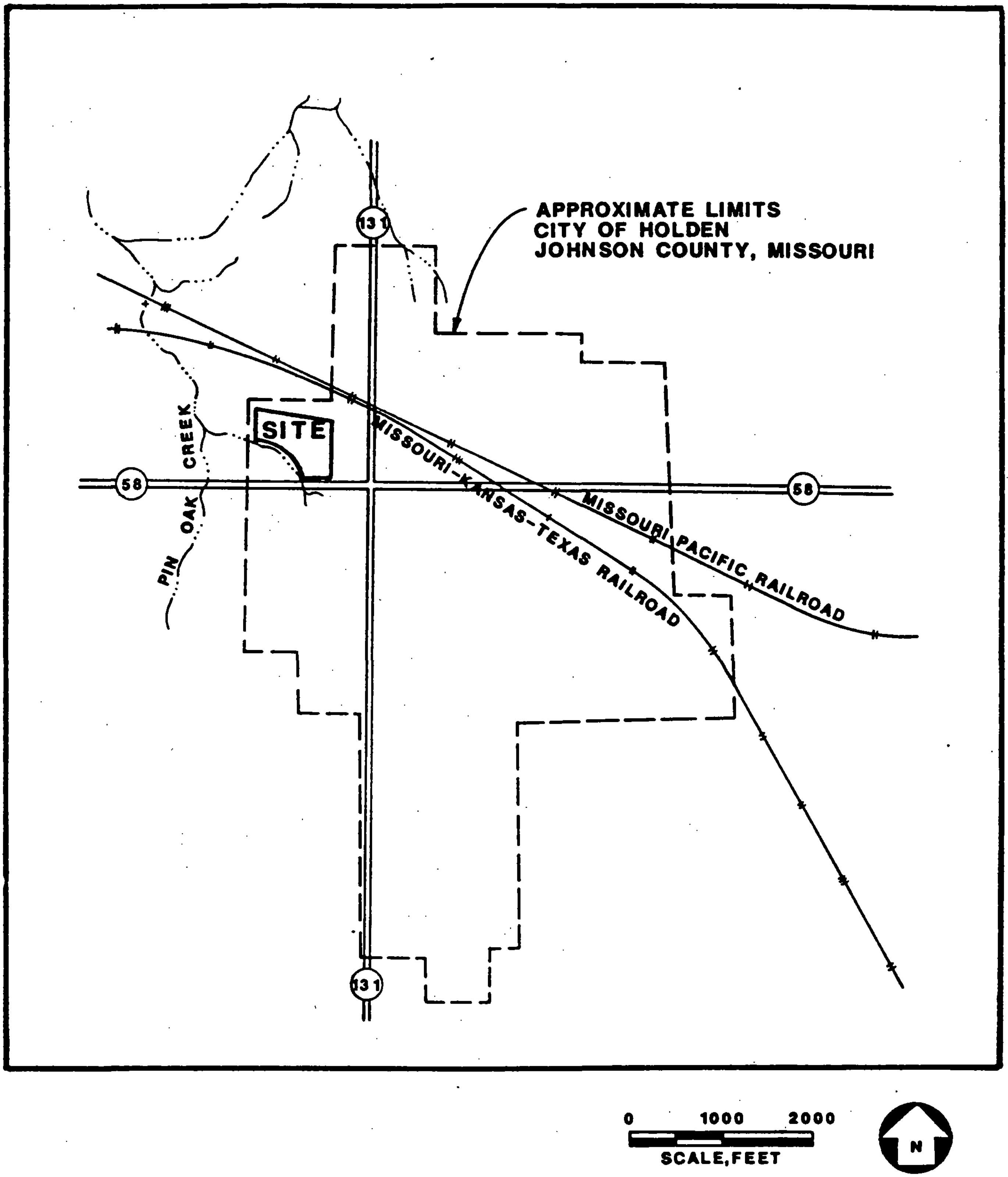
2 INTRODUCTION

This report summarizes the efforts by John Mathes & Associates, Inc. (Mathes) for Clean Sites, Inc. (CSI) on a preliminary site assessment of the Rose Chemical Facility in Holden, Missouri (Figure 1). Holden is located in Johnson County in the western portion of the state approximately 45 miles southeast of Kansas City. The Rose Chemical facility is located one block northwest of the intersection of Highways 58 and 131 within the city limits. Two warehouses are present at the site.

This work was performed in accordance with Contract Number CSI-SA-87.03, dated June 1987, and as modified by CSI during the course of the project. The original scope of work as defined in the contract is included as Appendix A. Certain preparatory tasks were performed prior to the date of the contract in order to complete the identified on-site scope of work efficiently and within schedule.

2.1 Selected background data

Background data used in the generation and modification of the scope of work performed on-site include a chronology of site and main warehouse use. Information on surface soil PCB contamination, as displayed on maps provided



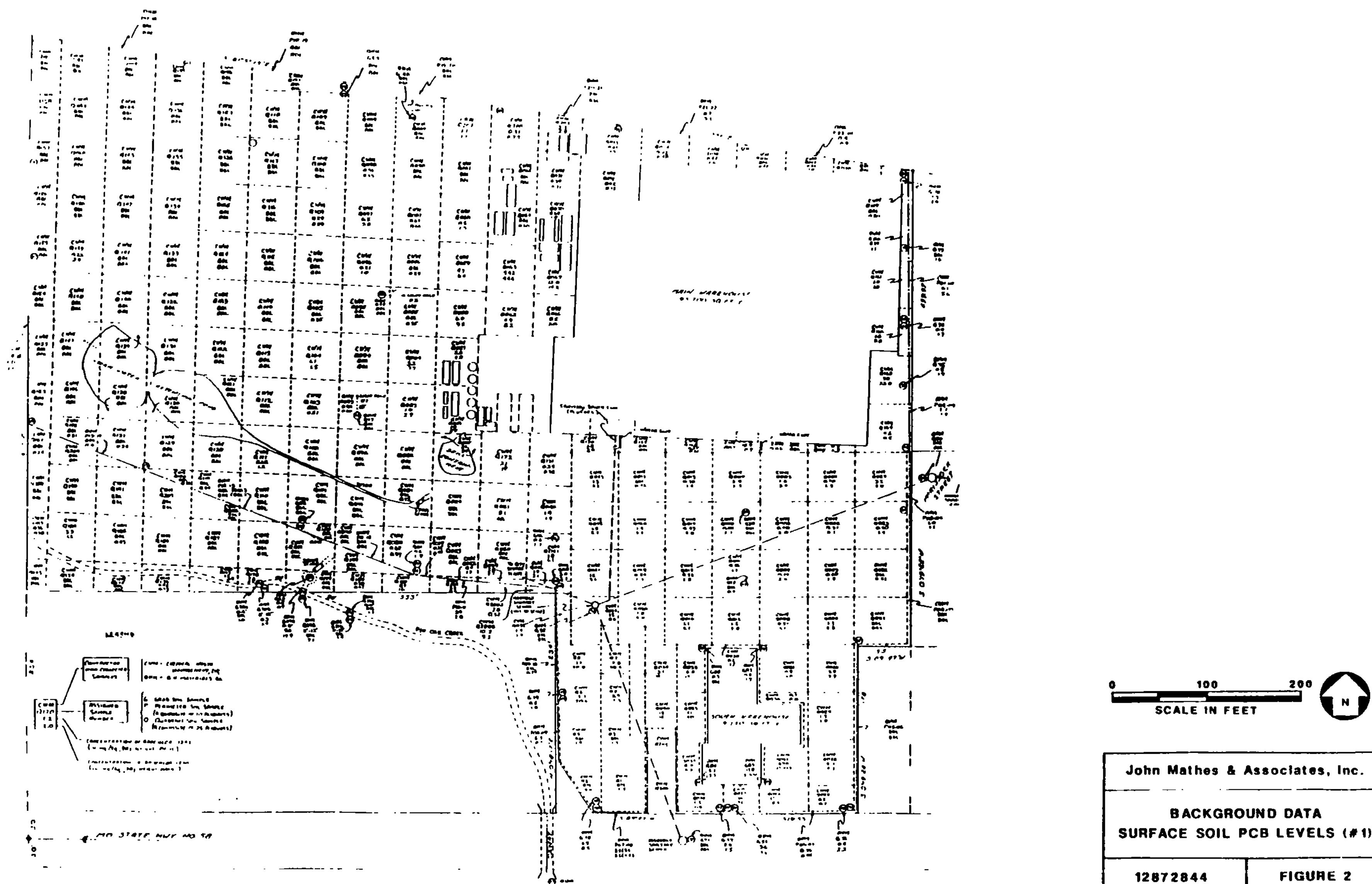
John Mathes & Associates, Inc.	
SITE LOCATION MAP	
12872844	FIGURE 1

by CSI were also used (Figures 2 and 3). Figure 2 shows PCB concentrations in surface soils across the site (one composite sample per 50 feet x 50 feet grid). Figure 3 shows PCB levels in areas where samples were composited over one-quarter of the original grid area.

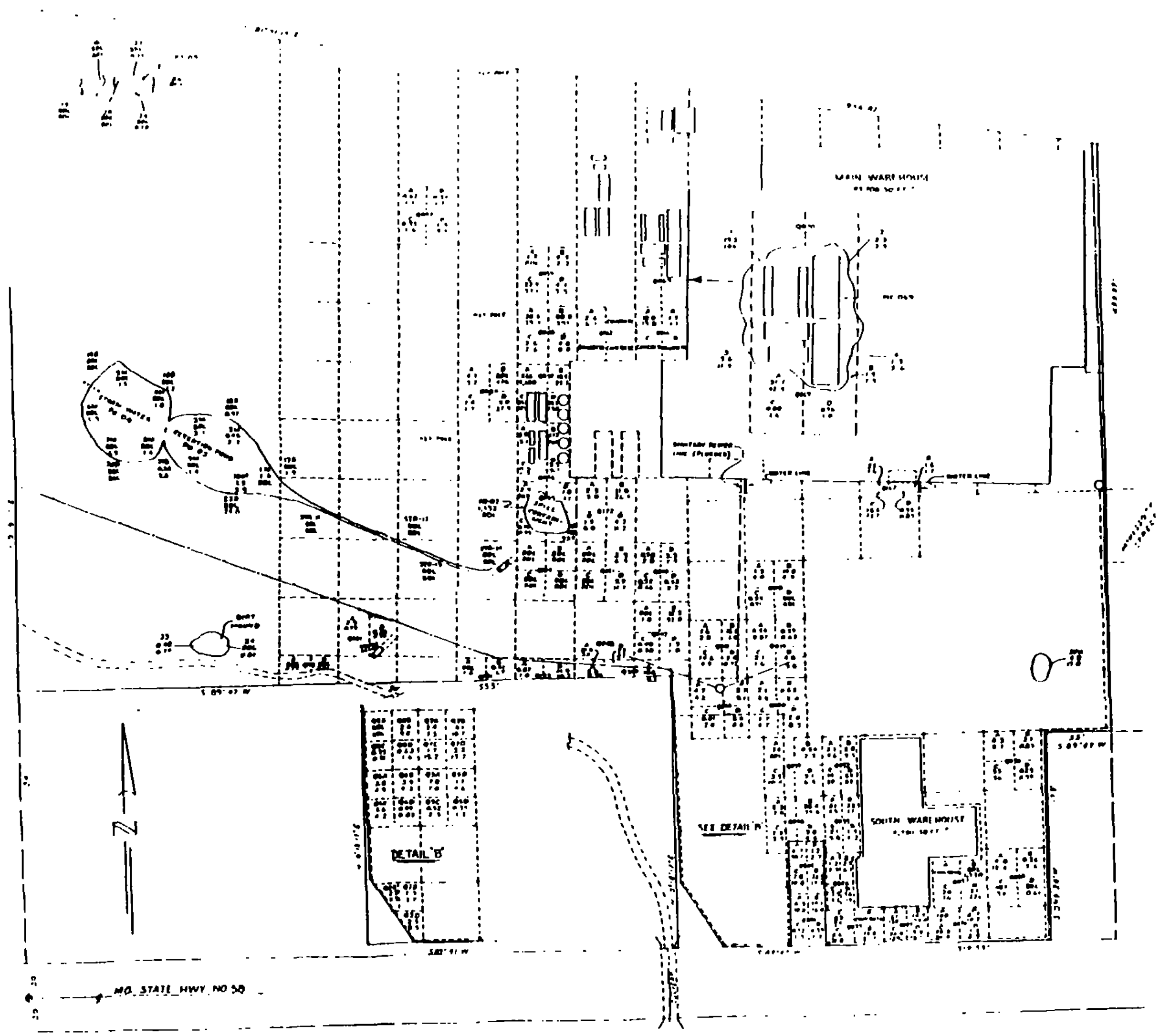
Data available on the history of the main warehouse and the entire site indicate that the primary owners were involved in steel fabrication (American Steel), farm implement assembly and painting (Royal Industries), and waste oil and corresponding equipment recycling (Rose Chemical). The use of the main warehouse in metal working and painting indicated that volatile organic solvents may have been used on-site. These chemical compounds are also sometimes used in the cutting of waste oils during cleaning and degreasing.

2.2 Investigative objectives

The primary objective of this site investigation and preliminary assessment was to collect on-site data that would aid in the preliminary site hydrogeologic and contaminant characterization for use by the potentially responsible parties (PRPs). This preliminary evaluation would then form the basis of any initial cost estimate for remediation and also in the generation of the remedial investigation scope of work, if appropriate. CSI informed USEPA Region VII of the



John Mathes & Associates, Inc.	
BACKGROUND DATA SURFACE SOIL PCB LEVELS (#1)	
12872844	FIGURE 2



John Mathes & Associates, Inc.

BACKGROUND DATA
SURFACE SOIL PCB LEVELS (#2)

12872844	FIGURE 3

investigation and informed them that cooperation would be given to them by CSI and Mathes if USEPA requested oversight of the activities. Representatives of Black and Veatch, Engineers-Architects were on-site in an oversight capacity for USEPA Region VII during most of the field activities.

2.3 Investigative scope and schedule

The site investigation was performed in two phases. The first phase of the investigation involved certain screening procedures to assist in the identification of sampling locations for the second phase. The screening procedures used in Phase I included a soil-gas investigation and a surface geophysical investigation. The results from these efforts were used as a partial basis for the selection of sampling locations in Phase II.

The Phase II investigation consisted of: shallow soil sampling in the main warehouse and at 25 locations across the site; three geologic test borings to a depth of approximately 50 feet; geophysical logging of the three test borings, installation of six groundwater monitoring wells (one shallow top-of-bedrock well and one bedrock well at each of three locations); groundwater sampling, and a surface geophysical investigation over suspected burial areas.

Table 1 presents a chronology of the on-site field activities performed by Mathes and Mathes' subcontractors during this investigation.

Table 1
ROSE CHEMICAL PROJECT
ON-SITE ACTIVITIES CHRONOLOGY

June 1987 Date	2	3	4	5	9	10	11	12	13	14	15	16
Soil Gas Survey		X	X	X								
Surface Geophysics	X	X	X	X								
Geologic Test Borings					set #3 casing	set #1 casing	core #3	core and ream #3	ream #1 ream #3	set #2 casing	core #2	
Monitoring Well Installations												
5 Foot Soil Borings (SB-#)					20	4, 5 25			17, 9 10			3, 2, 1, 24, 13
Geophysical Well Logging							TB-1	TB-1 TB-3				
Warehouse Visits	X					layout borings						
Warehouse Floor Coring and Soil Samp.												
# Persons On-Site	3	3	2	2	5	5	4	4	5	4	5	4
Level of Protection	C	D	D	D	D	C	C	D	C	C	C	C
Night Work								X	X	X	X	
Temperature	High 70's	70's to 80's	Low 80's	Mid-High 80's	V. Hot	V. Hot	V. Hot	V. Hot	V. Hot	V. Hot	V. Hot	V. Hot
Weather	Sunny, Breezy	Thunder-storms	Partly Cloudy and Sunny w/ Lt.-Mod. Winds	Sunny w/ Lt. Winds Calm		Rain Humid		Humid	Humid	Humid	Humid	Humid

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Table 1, Continued
ROSE CHEMICAL PROJECT
ON-SITE ACTIVITIES CHRONONOLOGY

June 1987 Date	17	22	23	24	25	26	27	28	29	30	July-87 1	6	7
Soil Gas Survey													
Surface Geophysics											X		
Geologic Test Borings													
Monitoring Well Installations			201	203 103	101 102	202							
5 Foot Soil Borings	19, 21	14, 22 16, 7,	23, 15 12, 6	8, 18, 11									
Geophysical Well Logging					TB-2								
Warehouse Visits	X												
Warehouse Floor Coring and Soil Samp.								X	X	X			
# Persons On-Site	4	4	4	4	4	4	5	3	3	3	3	2	2
Level of Protection	D	C	C	D	D	D	D	C	C	C	D	D	D
Night Work	X		X										
Temperature	V. Hot	Warm	Cldy. Rainy	Warm	Mild	Warm	Warm	Warm	Warm	Warm	Warm	Hot	Mild
Weather	Humid	Cldy. Humid	Humid	Ptly. Cldy.	Ptly. Cldy.	Ptly. Cldy.	Ptly. Cldy.	Ptly. Cldy.	Ptly. Cldy.	Heavy Rain	Humid	Heavy Rain	Heavy Rain

JULY/87/0053i

3 PHASE I FIELD ACTIVITIES

Phase I of the investigation involved certain screening procedures to assist in the identification of sampling locations for the Phase II. The screening procedures used in Phase I included an examination of the main warehouse interior floor slab, a soil-gas investigation, and a surface geophysical investigation. These activities were performed during the week of June 5, 1987.

3.1 Main warehouse floor slab examination

Mathes personnel were given a tour of the main warehouse by C. Kline (CSI) and C. Glore (CSI). This tour included a historical overview of the main warehouse and an examination of the floor slab in an effort to identify areas of surface staining (oils) and cracks or joints in the concrete. An air monitoring survey was performed during this tour by Mathes for health & safety purposes. During and subsequent to this visit, the locations for the Phase II warehouse soil sampling were recommended by Mathes and approved by CSI.

3.2 Soil gas investigation

The subcontractor used for the soil-gas investigation was Tracer Research Corporation of Tuscon, Arizona. A copy of their final report of investigations is included as Appendix B to this report.

3.2.1 Objectives

A soil-gas investigation was chosen as a screening procedure for Phase II activities because of the suspected use of volatile organic compounds (VOCs) on-site by Rose Chemical and other operations. It was also possible that interaction with VOCs may have caused PCBs to desorb from clays or soil organic material in the near surface and migrate from the source area along with the VOCs. Table 2 presents the rationale for the selection of the soil-gas sampling locations.

3.2.2 Sampling locations and methodology

The soil gas investigation consisted of sampling soil vapors at 39 locations across the site. These locations are

Table 2

ROSE CHEMICAL PROJECT
SOIL GAS SAMPLING LOCATIONS AND RATIONALE

LOCATION	QUADRANT	Rationale (See corresponding notes) #1	#2	#3	#4	#5	#6	#7	#8	#9	#10
SG-1	Q171	x	x	x							
SG-2	Q164		x	x		x					
SG-3	Q168	x	x	x							
SG-4	Q9	x	x	x							
SG-5	Q164	x	x	x							
SG-6	Q43	x	x	x		x					
SG-7	Q41	x				x					
SG-8	Q49	x				x				x	
SG-9	Q44	x				x				x	
SG-10	Q6	x				x				x	
SG-11	Q33	x	x	x						x	
SG-12	Q34	x	x	x						x	
SG-13	Q3	x				x		x		x	
SG-14	Q10	x									
SG-15	Q12	x				x					
SG-16	Q35	x				x					
SG-17	Q26	x				x					
SG-18	Q27	x				x					
SG-19	Q172	x	x	x	x		x				
SG-20	Q82						x			x	
SG-21	Q92						x			x	
SG-22	Q83	x			x						
SG-23	Q84	x			x						
SG-24	Q103	x					x	x		x	
SG-25	Q66	x	x	x							
SG-26	Q60	x			x					x	
SG-27	Q74	x	x	x							
SG-28	Q72	x	x	x						x	
SG-29	Q71	x	x	x	x					x	
SG-30	Q63				x					x	

Table 2 (continued)

ROSE CHEMICAL PROJECT
SOIL GAS SAMPLING LOCATIONS AND RATIONALE

LOCATION	QUADRANT	Rationale (See corresponding notes) #1	#2	#3	#4	#5	#6	#7	#8	#9	#10
SG-31	Q97	x									
SG-32	Q136								x		
SG-33	Q144								x		
SG-34	Q155										x
SG-35	Q153						x			x	x
SG-36	Q123									x	x
SG-37	Q96	x								x	
SG-38	Q53					x	x	x		x	
SG-39	Q129						x	x		x	

Notes:

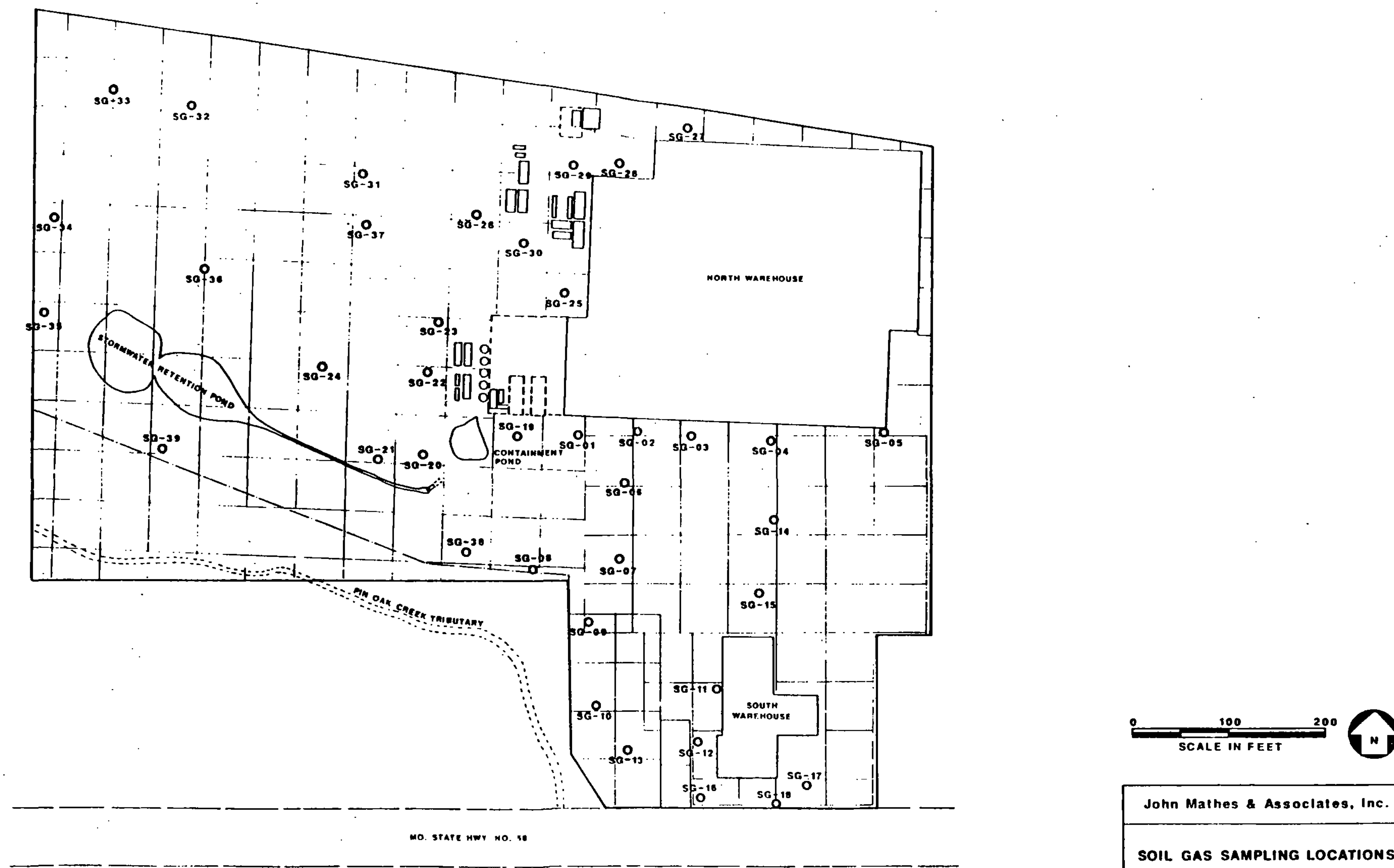
1 - Surface PCB contamination
2 - Potential VOCs
3 - Building vicinity
4 - Tank areas
5 - Utility/Sewer lines
6 - Pond areas
7 - Surface geophysics (EM) anomaly
8 - Burn pit vicinity
9 - Surface topographic low
10 - Open area - no information

presented on Figure 4. To obtain a sample, a precleaned metal hollow probe was driven into the ground. A vacuum was then placed on the probe and soil vapors were withdrawn from voids in the soil matrix. A sample of these soil vapors were then injected into a field gas chromatograph and analyzed on-site. The analytical parameters consisted of TCE (trichloroethene), TCA (trichloroethane), PCE (tetrachloroethene), BTX (benzene, toluene, xylene), and total hydrocarbons (excluding methane).

3.2.3 Results

The analyses indicate that volatile organic vapors are present in the soils at two primary locations. TCE, PCE, and TCA were detected west of the south warehouse. Lesser levels of VOCs were detected in samples from the vicinity of the loading dock and from the vicinity of the northwest corner of the Main Warehouse.

BTX and total hydrocarbons were detected in the areas west and northwest of the Main Warehouse loading dock and tanks (southwest corner of the warehouse) and in the area west of the South Warehouse. The highest levels of total hydrocarbons and BTX were detected in the vicinity of the tanks west of the loading dock.



John Mathes & Associates, Inc.	
SOIL GAS SAMPLING LOCATIONS	
12872844	FIGURE 4

At soil gas sampling location SG-23, BTX and total hydrocarbons were detected at concentrations of 16,222 ug/L and 14,000 ug/L respectively. The levels of these compounds encountered at this location were enough to contaminate the gas chromatograph column. This was the last sampling point of the day and the equipment was allowed to self-clean overnight. The crew discovered that the equipment necessary for the analysis of BTX and total hydrocarbons had been affected by the sample taken at SG-23 the previous day. CSI decided that because of the schedule restraints, the soil gas sampling would be completed using the available analytical parameters (TCE, TCA, PCE). Table 3 presents a condensed version of the soil-gas results found in the Appendix B report.

3.3 Surface geophysical investigation

A surface geophysical survey was performed across open areas of the site. This survey consisted of a electromagnetic conductivity survey (EM) and a magnetometer survey. This work was performed by Mathes during the week of June 5, 1987.

Table 3
ROSE CHEMICAL SITE
SOIL GAS DATA

Tracer Research Corporation

JOHN MATHES & ASSOCIATES-ROSE CHEMICAL-HOLDEN, MISSOURI

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Xylene (ug/l)	Total Hydroc. (ug/l)
SG01	1.5'	06/03	0.02	0.004	0.002	<0.04	<0.04	<0.05	<0.04
SG02	2'	06/03	0.005	0.002	0.0008	<0.04	<0.04	<0.05	<0.04
SG03	2.5'	06/03	0.02	0.007	0.0004	<0.04	<0.04	<0.05	<0.04
SG04	3'	06/03	0.02	0.007	0.004	0.2	0.2	<0.05	0.4
SG05	2'	06/03	0.01	0.002	<0.00004	<0.04	<0.04	<0.05	<0.04
SG06	1.5'	06/03	0.002	0.006	<0.00009	<0.08	<0.08	<0.09	<0.08
SG07	3'	06/03	0.03	0.005	<0.00009	<0.04	<0.04	<0.05	<0.04
SG08	1.5'	06/03	0.0006	0.002	0.01	<0.08	<0.08	<0.09	<0.08
SG09	2'	06/03	1	0.01	0.3	<0.08	<0.08	<0.09	<0.08
SG10	2.5'	06/03	2	30	4	<0.08	<0.08	<0.09	16
SG11	1.5'	06/03	0.8	2	0.6	<0.08	<0.08	<0.09	1
SG12	1.5'	06/03	0.008	0.06	0.08	<0.08	<0.08	<0.09	<0.08
SG13	2'	06/03	3	45	2	<0.08	<0.08	<0.09	21
SG14	1.5'	06/04	0.002	<0.0003	<0.00009	<0.04	<0.04	<0.04	<0.04
SG15	1.5'	06/04	0.002	<0.0003	0.0001	<0.04	<0.04	<0.04	<0.04
SG16	1.5'	06/04	0.002	<0.0003	<0.0005	0.4	0.2	<0.04	1
SG17	2.5'	06/04	0.002	<0.0003	0.0004	<0.04	<0.04	<0.04	<0.04
SG18	3'	06/04	0.002	<0.0003	<0.0009	<0.04	<0.04	<0.04	<0.04
SG19	2.5'	06/04	0.006	<0.002	0.2	<0.04	<0.04	<0.04	<0.04
SG20	1.5'	06/04	0.0005	0.001	0.0004	<0.07	<0.08	<0.09	<0.07
SG21	2.5'	06/04	0.0006	<0.0003	<0.00009	<0.07	<0.08	<0.09	<0.07
SG22	2'	06/04	0.002	<0.0003	0.006	<0.04	<0.04	<0.04	<0.04
SG23	3'	06/04	0.002	0.4	0.2	22	4,200	12,000	14,000
SG24	4'	06/04	0.001	0.001	<0.0002	N/A	N/A	N/A	N/A
SG25	1.5'	06/05	0.002	0.006	<0.00008	N/A	N/A	N/A	N/A
SG26	1.5'	06/05	0.0006	<0.0003	0.0002	N/A	N/A	N/A	N/A
SG27	4'	06/05	0.2	0.1	2	N/A	N/A	N/A	N/A
SG28	5.5'	06/05	0.02	0.0007	0.002	N/A	N/A	N/A	N/A

Notations:
' [illegible] with adjacent peaks

Analyzed by ___M. Favero________

Table 3 (Continued)
ROSE CHEMICAL SITE
SOIL GAS DATA

Tracer Research Corporation

MATHES & ASSOCIATES-ROSE CHEMICAL-HOLDEN MISSOURI

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Xylenes (ug/l)	Total Hydrocarbons (ug/l)
SG29	5'	06/05	0.008	0.002	0.001	N/A	N/A	N/A	N/A
SG30	5.5'	06/05	0.001	0.002	0.0006	N/A	N/A	N/A	N/A
SG31	5'	06/05	0.002	0.002	0.0005	N/A	N/A	N/A	N/A
SG32	5'	06/05	0.001	0.002	<0.00008	N/A	N/A	N/A	N/A
SG33	5'	06/05	0.001	0.002	<0.00008	N/A	N/A	N/A	N/A
SG34	5'	06/05	0.002	0.002	0.001	N/A	N/A	N/A	N/A
SG35	5'	06/05	0.001	0.0008	0.0006	N/A	N/A	N/A	N/A
SG36	4'	06/05	0.0007	<0.0003	<0.00008	N/A	N/A	N/A	N/A
SG37	5'	06/05	0.0007	<0.0003	<0.00008	N/A	N/A	N/A	N/A
SG38	5'	06/05	0.001	0.001	0.0004	N/A	N/A	N/A	N/A
SG39	5'	06/05	0.002	0.002	0.0003	N/A	N/A	N/A	N/A

Notations:

Analyzed by M. Favero

3.3.1 Objectives

The objective of the surface geophysical survey was to assess the potential for large scale trenching and/or burial across the site. The methodology used was chosen for its ability to delineate large (approximately 50 feet long) areas of trenching and burial.

3.3.2 Methodology and locations

The EM survey was performed to identify any anomalous areas across the site. A preliminary EM survey was performed off-site to the north to give control for the on-site survey. The site grid used in the previous surface soil sampling by CSI was reestablished to give lateral control to the surface geophysical survey and to any subsequent activities on-site.

The EM survey was performed with a Geonics EM-34 (horizontal dipole) on 10-meter spacings. Readings were taken of apparent conductivity at each intersection of grid lines. Anomalous areas were identified by the comparison of readings within any specific area.

A magnetometer survey was then conducted across the anomalous areas previously identified by EM for the purpose of identifying potentially buried metal objects.

3.3.3 Results

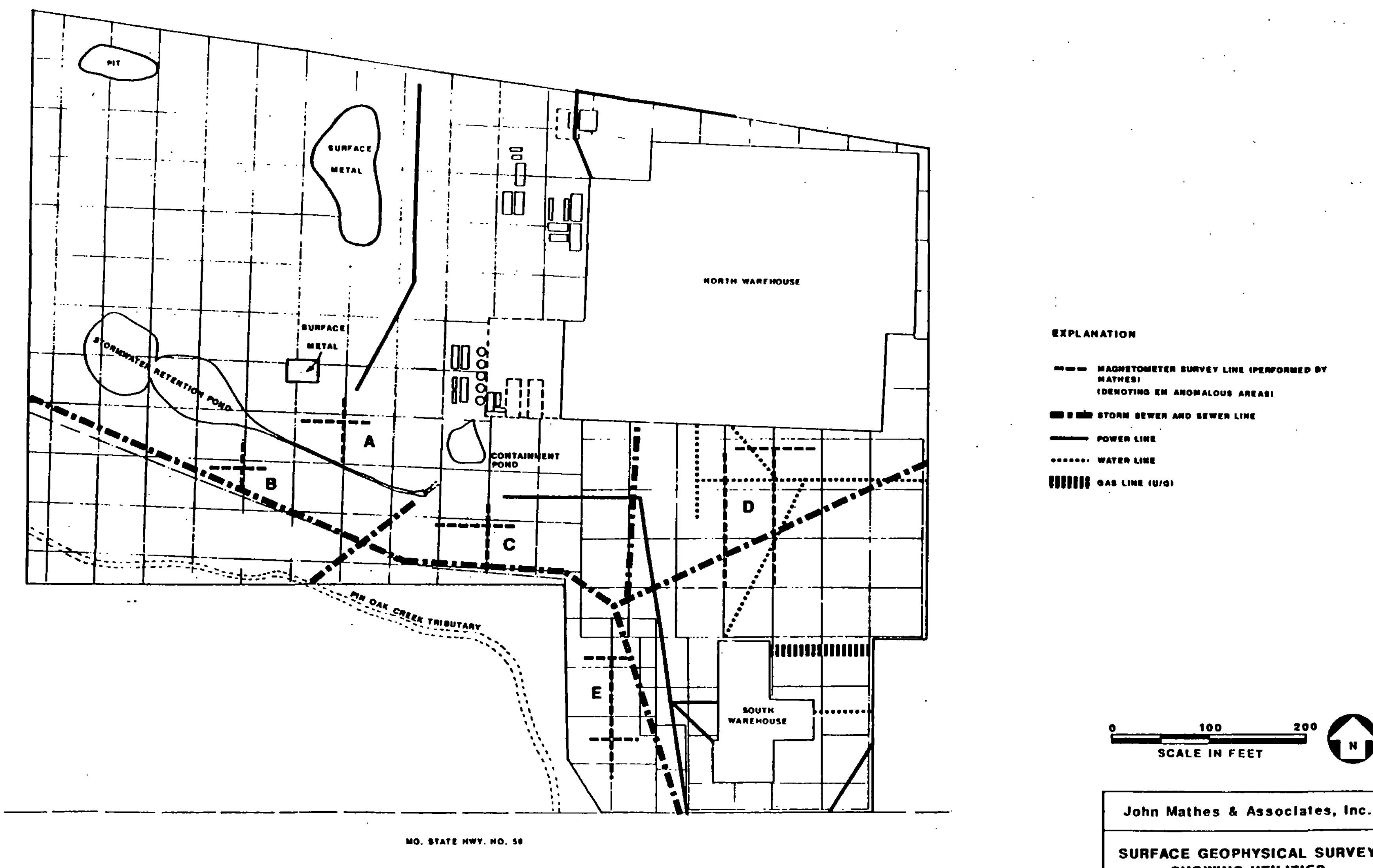
Figure 5 presents the areas which were considered anomalous from an evaluation of the EM data and shows the location of the resulting magnetometer surveys. An evaluation of the resulting data indicates that the potential for large on-side trenches (greater than 50 feet in length) is low. The anomalous areas defined by EM were generally found to be in the vicinity of metal underground utilities or near above-ground metal or electrical features (fences, power lines). The anomalous areas and their corresponding evaluations are discussed below:

<u>Area A</u>

Changes in conductivity are probably due to topographic and saturation changes (ponds and ditches), and the existence of a power line to the north.

<u>Areas B and C</u>

Changes in conductivity are probably due to topographic and saturation changes (ponds and ditches) and to a fence line to the south.



John Mathes & Associates, Inc.

SURFACE GEOPHYSICAL SURVEY SHOWING UTILITIES

12872844	FIGURE 5

Areas D and E

Figure 5 presents utilities as observed or located with a metal detector. Changes in conductivity are probably due to these features. Area D is near a building which creates interferences. Area E is near a fence line to the west and south.

4 PHASE II FIELD ACTIVITIES

Phase II field activities consisted of a shallow soil sampling program (25 locations), three geologic test borings, warehouse soil sampling (7 locations), installation of six groundwater monitoring wells in-situ aquifer testing in the monitoring wells, and one round of groundwater sampling. The three geologic test borings were geophysically logged and a detailed surface geophysical survey was performed in suspected burial areas.

The following sections describe the activities performed at the Rose Chemical facility. Analytical results of the sampling events and an evaluation of these results are presented in Section 5.

4.1 Geologic test drilling and monitoring well installations

Three geologic test borings were drilled on-site to a depth of approximately 50 feet. Deep monitoring wells were installed in these boreholes. A shallow monitoring well was installed in a borehole drilled to refusal (top of bedrock) immediately east of each deep well.

4.1.1 Objectives

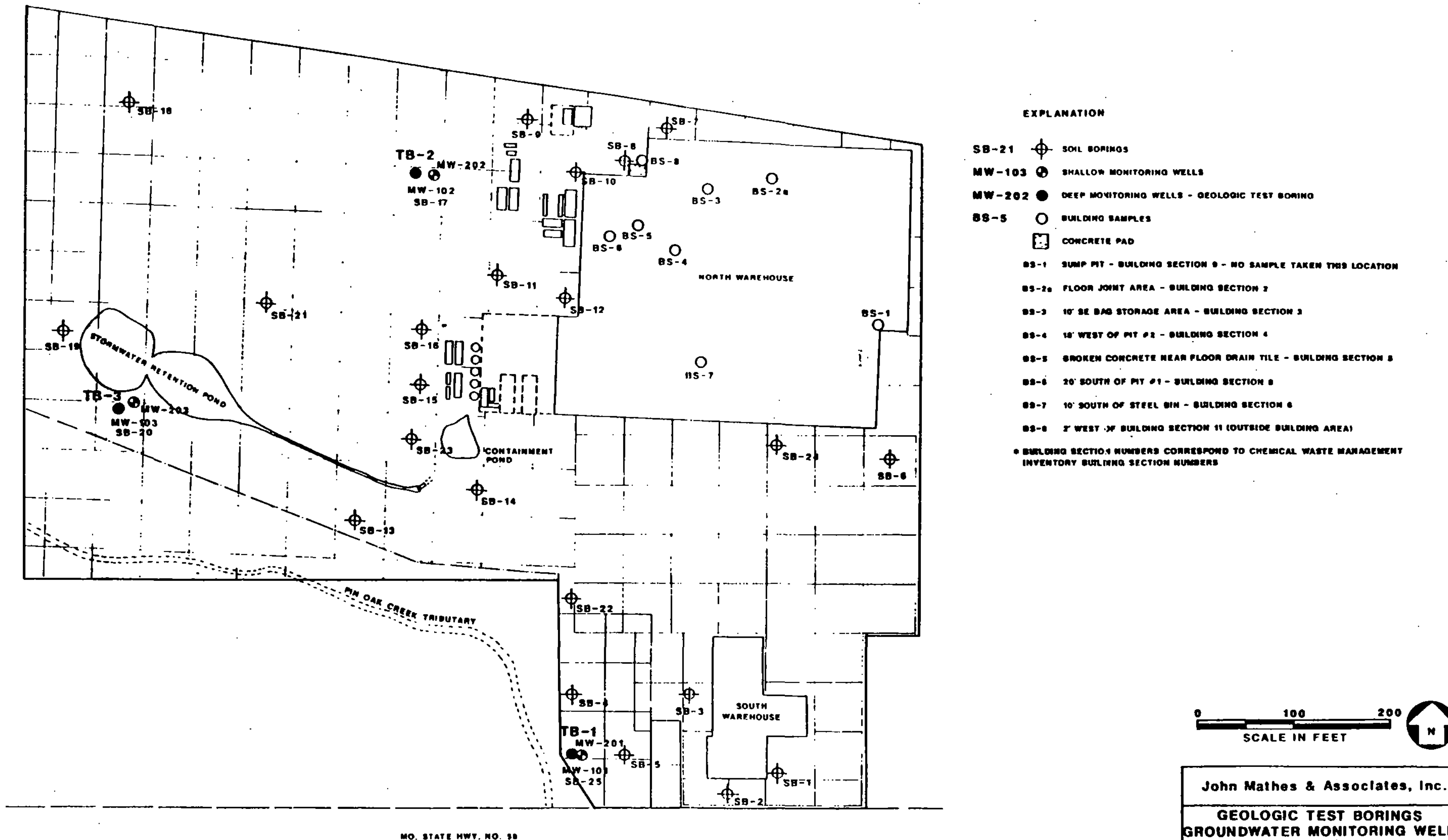
The objectives of the geologic test boreholes were to: obtain soil samples for physical testing from overburden soils; preliminarily define the stratigraphic section at three locations across the site; preliminarily define the geologic structure across the site; evaluate the stratigraphy and permeability of the bedrock units by geophysical logging; and, allow the installation of deep groundwater monitoring wells.

4.1.2 Locations

The locations of the three geologic test borings were selected based on the following rationale:

- o To establish local geologic structure, the locations should be well spaced in a triangular fashion; and
- o To evaluate vertical migration of groundwater and potential contaminants, the locations should be placed in areas shown to have surface contamination of PCBs and in areas near on-site tanks, ponds, and buildings.

The selected locations are shown in Figure 6. Geologic test boring TB-1 is located west of the South Warehouse in an area which showed potential contamination by VOCs (soil-gas investigation - see Section 3.2). Geologic test



John Mathes & Associates, Inc.

GEOLOGIC TEST BORINGS GROUNDWATER MONITORING WELLS & SHALLOW SOIL BORING LOCATIONS

12872844	FIGURE 6

boring TB-2 is located west of the Main Warehouse near a group of tanks containing PCB laden waste oils and fluids. Geologic test boring TB-3 is located in the southwest corner of the site. The surface soils in the area of TB-3 are normally saturated after precipitation events because it is a surface topographic low area. Surface water runoff from the western one-half of the site and overflow from the storm water retention ponds moves across this area on its way to the unnamed tributary of Pin Oak Creek, which is located south of the site.

4.1.3 Geologic test drilling

Three geologic test borings were drilled to a depth of approximately 50 feet. Appendix C presents the geologic test borehole logs. The test boreholes were drilled with 4-1/4 inch hollow stem augers and a continuous tube sampling system to refusal (top of bedrock). Refusal occurred at depths of 12 to 18 feet below ground surface. To minimize downward migration of any potential contaminants, the overburden soils were sealed off by grouting casing in place. After the casing grout had set, the boring was continued by coring using a NX wireline system through the bedrock to approximately 50 feet.

It was observed during the drilling of the first borings (TB-1 and TB-3) that the overburden soils (primarily clays) and the uppermost bedrock unit (shale) were fairly dry. The shales appeared to swell and seal off the boring near the top of bedrock during coring. It became necessary to repeatedly ream out the borehole and finally, to case off the upper shales and soils to keep the borehole open.

4.1.4 Geophysical well logging

Test borings numbered TB-1 and TB-3 were drilled per procedures detailed in Section 4.1.3, and geophysical logs were completed in these wells. The subcontractor who performed the logging was BPB Instruments, Inc., of Evansville, Indiana. The suite of logs run included resistivity, natural gamma, and neutron. Copies of these logs are included as Appendix D to this report. The delay caused by the need to repeatedly ream out these test borings caused a delay in the completion of TB-2. It was then estimated that the logging of TB-2 could not be performed for approximately two days. The geophysical logging crew (BPB) was released and a second subcontractor (Cornish Well Logging) was later used to log TB-2. The suite of logs run in TB-2 included natural gamma and neutron as approved by C. Glore (CSI).

4.1.5 Groundwater monitoring well installation

Monitoring wells were installed in all three test borings. Although the original scope of work called for ten feet of screened section in each monitoring well, it was decided, based on the apparent low permeability and from observations during and after drilling the test borings, that an additional ten feet of screened section would be added to the deep wells. This decision was made after the installation of the deep well at TB-3. The procedures used for the installation of the monitoring wells are described in Appendix K.

Shallow (top of bedrock) monitoring wells were installed in augered boreholes located near the corresponding 50-foot deep test boreholes and deep monitoring wells. Refusal occurred at a depth of approximately 13 feet at location MW201. A five foot screen section was installed in this shallow well to allow a suitably thick seal above the filter pack. All monitoring well elevations were surveyed within 0.01 foot (ground and top of riser) by Sherman & Bowers Surveying Co., Harrisonville, Missouri. Appendix C presents the groundwater monitoring well construction diagrams for all shallow and deep wells.

4.1.6 Soil sampling

Soil samples were collected for physical testing from the overburden soils at each of the three test borehole locations. These samples were transported to Columbia, Illinois for testing by Mathes. The tests performed on these samples included percent passing #200 sieve, hydrometer, falling head permeability, and Atterberg limits. Test results are presented in Appendix E.

4.1.7 Groundwater sampling

Each shallow and deep groundwater monitoring well was developed prior to sampling. The groundwater samples were shipped on ice under chain-of-custody to Langston Laboratories. The specific procedures used in monitoring well development and groundwater sampling are described in Appendix K. The groundwater samples were analyzed for PCBs and halogenated volatile organic compounds. Shallow groundwater monitoring well MW-201 was not sampled because of insufficient water. The water level in this well should be measured within 48 hours of a significant precipitation event and, if possible, the well should then be sampled.

4.1.8 In-situ aquifer permeability testing

In-situ aquifer permeability tests were performed in the shallow and deep groundwater monitoring wells. No test was performed in shallow well MW-201 because of the low water level. Procedures are detailed in Appendix K. Test results are presented in Section 5.3 and in Appendix F.

4.2 Shallow soil sampling

Shallow soil boreholes were drilled and samples were taken at 25 locations across the site. Duplicate samples were submitted to Langston Laboratories as a check on precision and repeatability. Split samples were submitted to the USEPA.

4.2.1 Objectives

The objective of the shallow soil drilling and sampling program was to chemically characterize the shallow soils across the site. The locations were chosen based on the existence of surface PCB contamination and/or due to the proximity of areas with potential for surface contamination from spills or surface discharges of fluid (tanks, buildings).

4.2.2 Locations

The locations of the 25 shallow boreholes are shown on Figure 6. Table 4 presents the rationale for the selection of the shallow soil borehole locations.

4.2.3 Sampling methodology

A five-foot continuous tube soil sample was collected at each shallow boring. Depending on the amount of recovery, this sample was then broken into 20-inch intervals. One sample was obtained from each 20-inch interval by trimming and disposing the outside of the sample and compositing the remainder of the sample and placing it in the respective sample containers for PCB and halogenated volatile organics analysis. The samples from the top two intervals (total of 40 inches) were then shipped under chain-of-custody to Langston Laboratories in Kansas. These samples were kept on ice after collection and were transported to the laboratory within 24 hours of sampling. The third, or lowest 20-inch interval sample was stored on ice in an on-site trailer. One duplicate soil sample was submitted for approximately every 10 samples submitted. Detailed sampling procedures are presented in Appendix K.

Table 4

ROSE CHEMICAL PROJECT
SHALLOW SOIL SAMPLING LOCATIONS AND RATIONALE

LOCATION	QUADRANT	Rationale (See corresponding notes) #1	#2	#3	#4	#5	#6	#7	#8	#9
SB-1	Q37	x	x	x						
SB-2	Q27	x	x	x						
SB-3	Q33	x	x	x						
SB-4	Q6	x	x							
SB-5	Q3	x	x							
SB-6	Q24	x	x	x						
SB-7	Q74		x	x						
SB-8	Q72		x	x						
SB-9	Q208		x		x					
SB-10	Q71		x	x	x					
SB-11	Q62	x	x	x	x					
SB-12	Q66	x	x	x	x					
SB-13	Q90	x				x				x
SB-14	Q54					x	x			
SB-15	Q83	x	x	x	x					
SB-16	Q84	x	x	x	x					
SB-17	Q87	x	x		x			x		
SB-18	Q144		x						x	
SB-19	Q147		x				x			
SB-20	Q137	x	x					x		
SB-21	Q114									x
SB-22	Q45	x	x			x				x
SB-23	Q82		x		x		x			x
SB-24	Q5	x	x	x						
SB-25	Q4	x	x					x		x

Notes:
1 - Surface PCB contamination
2 - Potential VOCs
3 - Building vicinity
4 - Tank areas
5 - Utility/Sewer lines
6 - Pond areas
7 - Surface geophysics (EM) anomaly
8 - Burn pit vicinity
9 - Surface topographic low

Prior to June 17, 1987, a sample was stored for the potential use of USEPA Region VII. The quantity of sample necessary for both the PCB and volatile organics analysis normally eliminated the preparation of split samples of the two upper intervals for USEPA. A representative of USEPA Region VII arrived on-site on June 17, 1987; at this time, 13 shallow soil borings had been completed. At the request of CSI, Mathes personnel discussed sampling procedures with the USEPA representative. The USEPA representative then requested one four ounce sample for PCB analysis only. Since the volume required by USEPA was reduced to four ounces, split samples were submitted to the USEPA as requested.

Shallow soil borehole logs were prepared for every location and are included as Appendix G.

4.3 Warehouse shallow soil sampling

Seven potential sampling locations were selected in the Main Warehouse during a tour and an examination of the floor slab described in Section 3.1.

4.3.1 Objective

The objective of the shallow soil sampling in the main warehouse was to evaluate the possibility of the migration of PCB laden oils and other potential contaminants through the warehouse floor into the underlying soils.

4.3.2 Sampling locations

Main warehouse sampling locations were chosen based on evidence of potential contamination and potential migration pathways to the subsurface soils. Figure 6 presents the locations chosen and the rationale for the selection of each location.

In addition, CSI directed Mathes to sample one location immediately outside the Main Warehouse just north of the concrete slab (northwest corner of warehouse). Although this sample was taken outside the warehouse, it was collected next to the wall and the same procedures were followed as in the warehouse shallow soil sampling (2-inch diameter split spoon - hand driven).

4.3.3 Sampling methodology

At each location, an electric jack-hammer was used to penetrate the warehouse concrete floor to allow the collection of soil samples. A two-inch split spoon was then driven to a depth of approximately two feet beneath the base of the concrete. At each location, a soil sample was collected with a split-spoon-sampler and sent to Langston Laboratories for analysis; a split sample was retained for the USEPA representative. The procedures used in the collection of these samples are detailed in Appendix K.

Elevated organic vapor readings were observed after penetration of the concrete at all sampling locations. Work at locations BS-2, BS-3, BS-5, BS-6, and BS-8 was delayed, due to these readings, to allow the location to vent. Mathes personnel vacated the area during these periods.

During the sampling event, it was discovered that the sampling location BS-1 was not a dug well as expected but appeared to be a concrete lined floor sump; it was not sampled. The Main Warehouse shallow soil borehole logs are included in Appendix H.

4.4 Surface geophysical investigation

During drilling at the original location of MW-202, a hard layer was encountered at a depth of approximately three feet. When this layer was penetrated, high organic vapor readings (greater than 100 needle deflection units (PPM) on the HNu) were observed in the borehole. Work at this location was continued in Level "C" protection. When the auger was removed from the ground, a 55-gallon drum lid and metal strapping were wrapped around the auger. Drilling was delayed at this time while the drill crew removed the metal from the auger. Since the metal and the elevated air monitoring readings indicated the potential for buried wastes, work at this location was discontinued and MW-202 was relocated.

A subcontractor, Neponset Geophysical of Neponset, Illinois, performed a detailed investigation of this and several other suspected burial areas. This investigation consisted of magnetometer and ground penetrating radar surveys.

4.4.1 Objectives

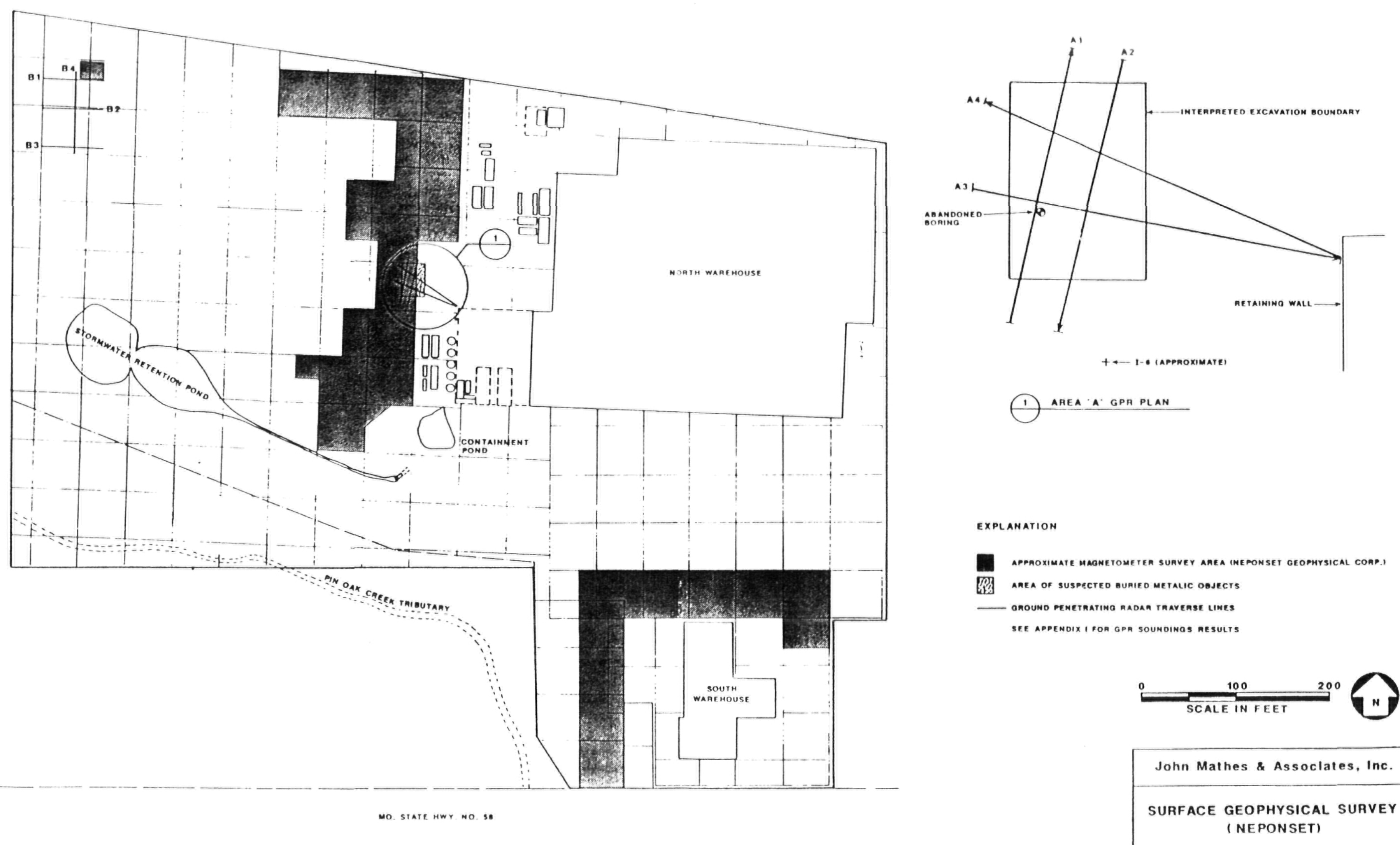
The objectives of this survey were to identify potential small areas of buried waste on-site.

4.4.2 Areas of investigation

The primary area of investigation was the vicinity of the attempted shallow monitoring well location MW-202. Other areas were surveyed as directed by CSI. The areas surveyed during this effort are shown in Figure 7.

4.4.3 Methodology and results

The survey consisted of an initial screening pass with a vertical fluxgate gradient magnetometer followed by use of ground penetrating radar in suspect areas. The report from the Neponset Geophysical is included in Appendix I. The results of this effort indicated that the only area showing potential for buried drums and/or waste was in the suspect area west of the Main Warehouse loading dock. This area is approximately 25 feet by 35 feet and is shown on Figure 7. The records of the ground penetrating radar (GPR) passes are also included in Appendix I.



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SURFACE GEOPHYSICAL SURVEY
(NEPONSET)

12872844

FIGURE 7

5 PRELIMINARY SITE ASSESSMENT

A preliminary site assessment has been made based on the data collected during the Mathes site investigation and on results from previous surface soil sampling, observations made during drilling and sampling, analytical results from the soil and groundwater samples collected, and from in-situ and laboratory testing of the on-site geologic materials.

5.1 Site surface-water hydrology

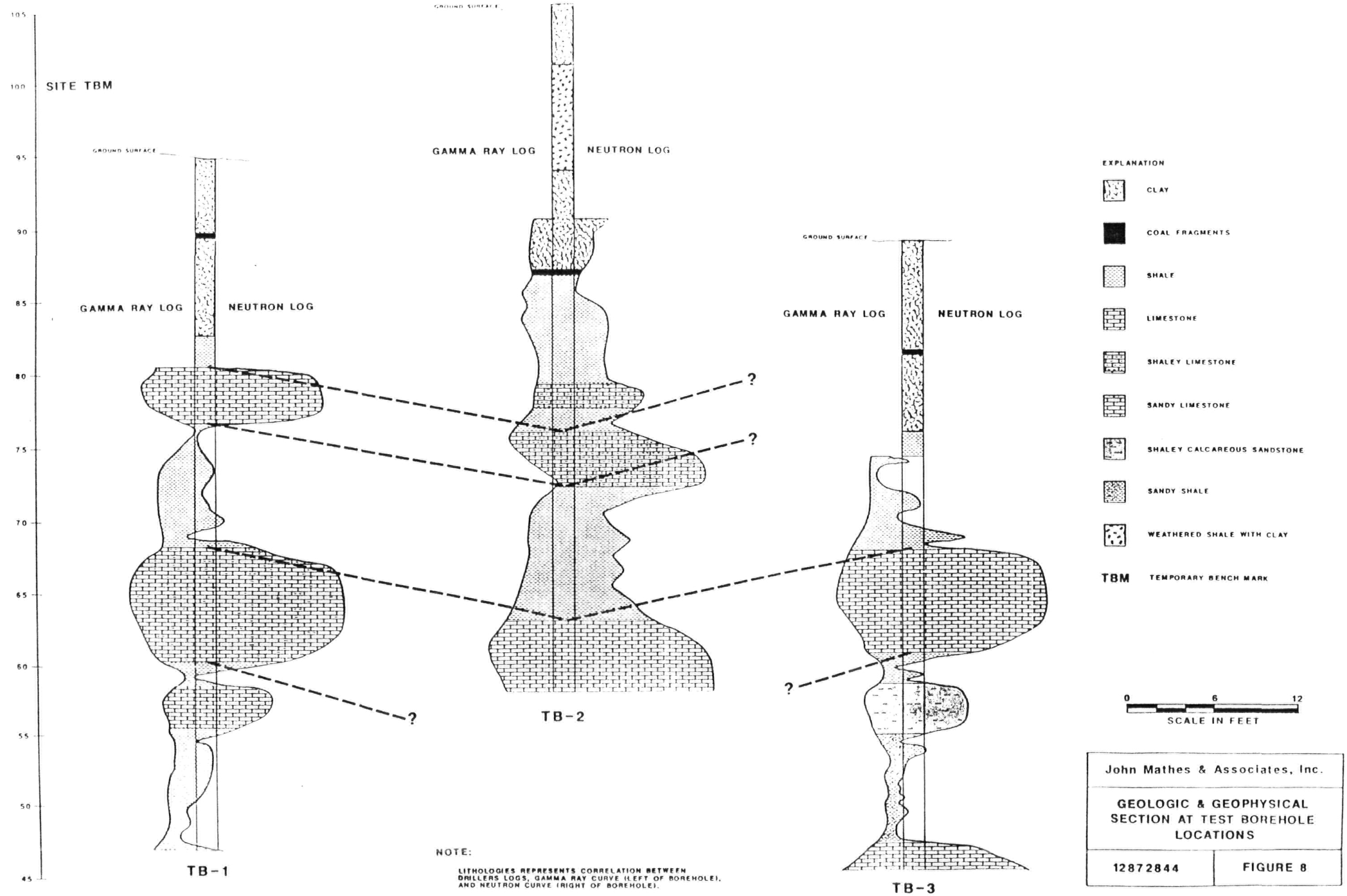
The site is located approximately one mile north of a major surface drainage divide that separates the Black River basin to the north from the South Grand River basin to the south. Surface water on-site flows primarily south-southwest to an unnamed tributary to Pin Oak Creek. Pin Oak Creek flows north to the Black River.

5.2 Site geology

Bedrock is overlain by up to 20 feet of unconsolidated residuum and soils. On-site, these deposits consist of the Haig soil series overlying shale residuum over the majority of the site. The Haig soils do not appear to be present in the vicinity of the tributary to Pin Oak Creek along the southern edge of the site. A generalized section at the site consists of 15 feet of clay loess and shale residuum overlying bedrock. The clay loess and shale residuum have a laboratory permeability of approximately 10^{-8} centimeters per second (cm/sec).

The underlying bedrock units consist of Pennsylvanian age clays, shales, limestones, and sandstones. The uppermost bedrock units belong to the Marmaton group. Figure 8 shows the geologic section at the three test boreholes along with the corresponding borehole geophysical logs. From correlation of the geologic and geophysical logs, it is inferred that the local bedrock dip is towards the north-northeast at approximately 58 feet per mile (Figure 9). Regionally, bedrock dip is generally to the north-northwest towards the Forest City Basin. Localized variations in strike and dip and even reversals in dip are common in this area. Figure 10 shows the top-of-bedrock erosional surface (dipping to the southeast) as inferred from observations made during test drilling. Figure 11 presents generalized geologic cross sections at the site.

Information obtained from Missouri Department of Natural Resources and from local water well drillers indicate that Mississippian age limestones are probably encountered at a depth of 200 feet in the Holden area.



NOTE:

LITHOLOGIES REPRESENTS CORRELATION BETWEEN DRILLERS LOGS, GAMMA RAY CURVE (LEFT OF BOREHOLE), AND NEUTRON CURVE (RIGHT OF BOREHOLE).

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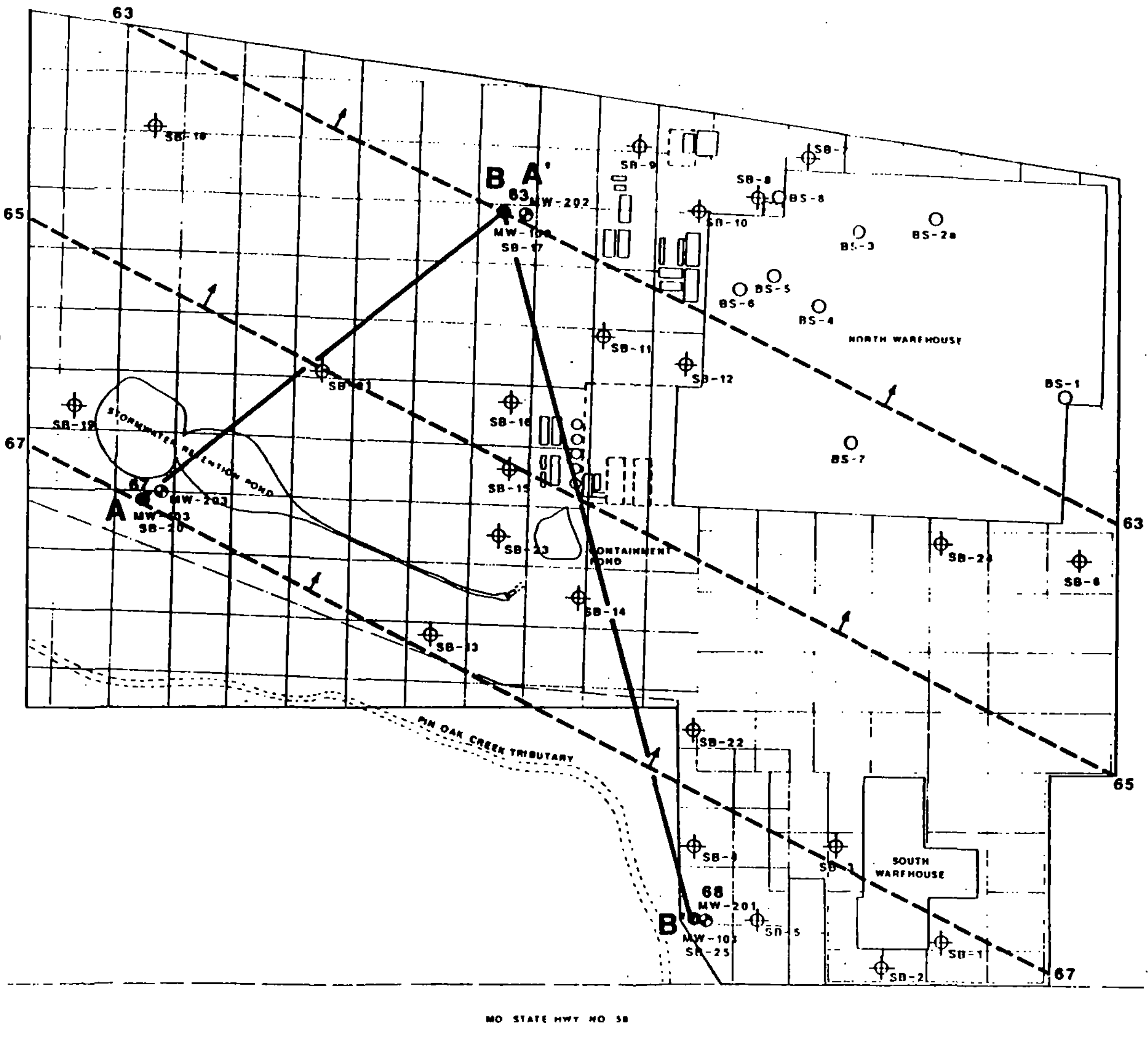
GEOLOGIC & GEOPHYSICAL SECTION AT TEST BOREHOLE LOCATIONS	
12872844	FIGURE 8



EXPLANATION

SB-21	⊕	SOIL BORINGS
MW-103	◕	SHALLOW MONITORING WELLS
MW-202	●	DEEP MONITORING WELLS - GEOLOGIC TEST BORING
BS-5	○	BUILDING SAMPLES
	⬚	CONCRETE PAD
65		TOP OF LIMESTONE MARKER BED AND DIRECTION OF LOCAL DIP

BS-1 SUMP PIT - BUILDING SECTION 9 - NO SAMPLE TAKEN THIS LOCATION

BS-2a FLOOR JOINT AREA - BUILDING SECTION 2

BS-3 10' SE BAG STORAGE AREA - BUILDING SECTION 3

BS-4 10' WEST OF PIT #2 - BUILDING SECTION 4

BS-5 BROKEN CONCRETE NEAR FLOOR DRAIN TILE - BUILDING SECTION 5

BS-6 20' SOUTH OF PIT #1 - BUILDING SECTION 6

BS-7 10' SOUTH OF STEEL BIN - BUILDING SECTION 6

BS-8 2' WEST OF BUILDING SECTION 11 (OUTSIDE BUILDING AREA)

* BUILDING SECTION NUMBERS CORRESPOND TO CHEMICAL WASTE MANAGEMENT INVENTORY BUILDING SECTION NUMBERS

CONTOUR INTERVAL IS FIVE FEET

DATUM IS AN ON-SITE TEMPORARY BENCH MARK (100)

0 100 200
SCALE IN FEET

N

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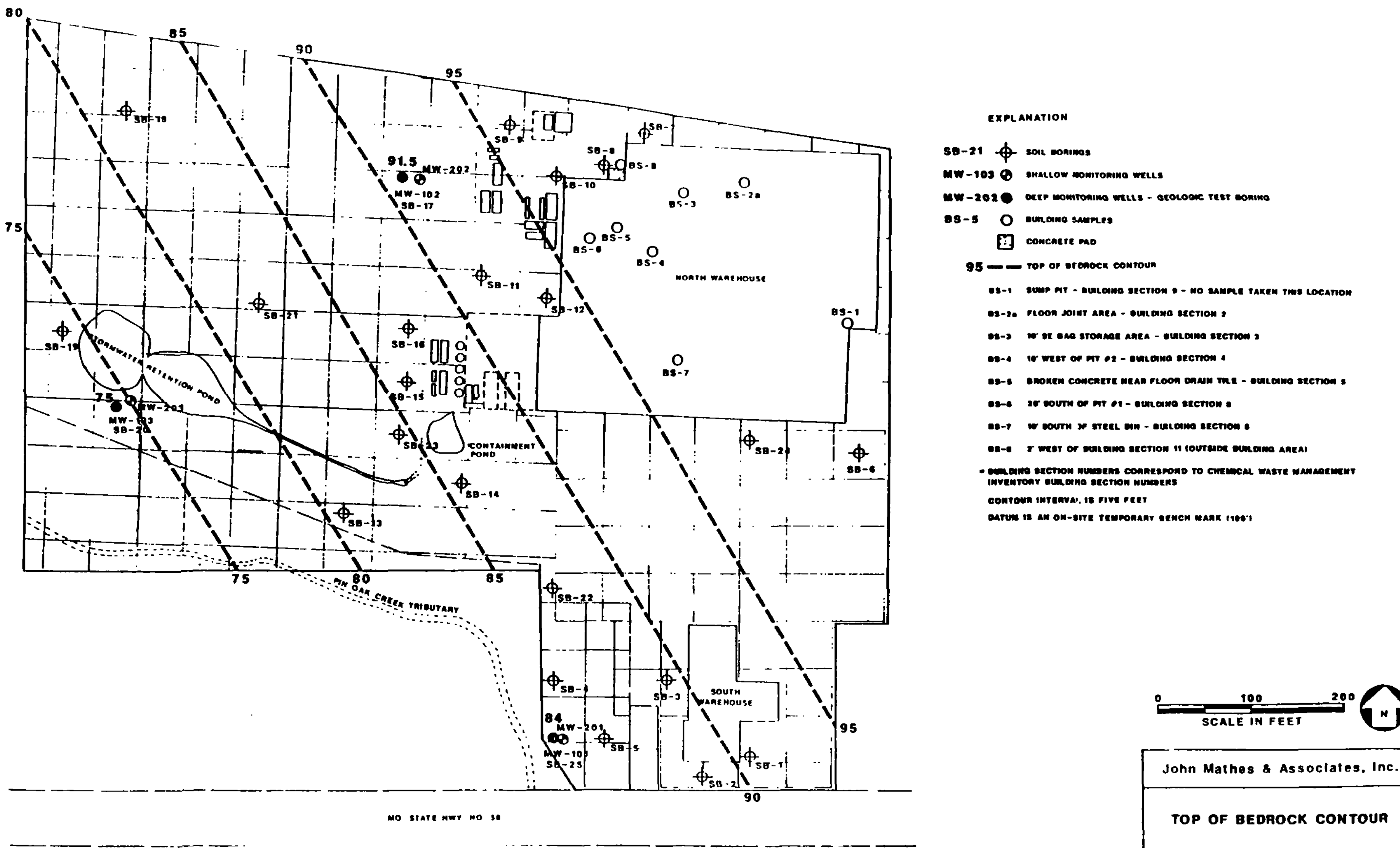
TOP OF LIMESTONE CONTOUR & LOCATION OF GEOLOGIC CROSS SECTIONS A - A' & B - B'

12872844 | **FIGURE 9**



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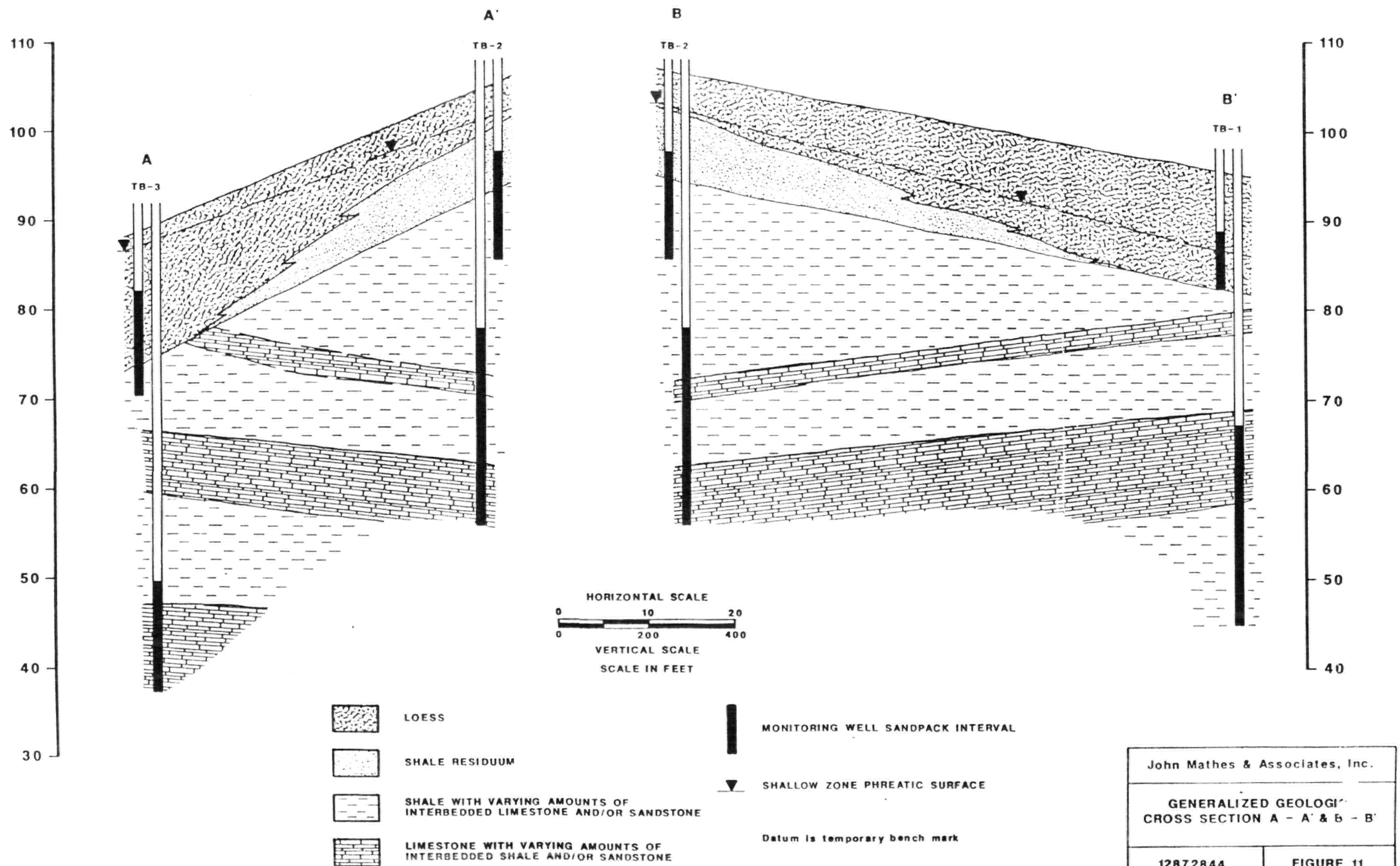
TOP OF BEDROCK CONTOUR

12872844 FIGURE 10



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GENERALIZED GEOLOGIC CROSS SECTION A - A' & B - B'

12872844

FIGURE 11

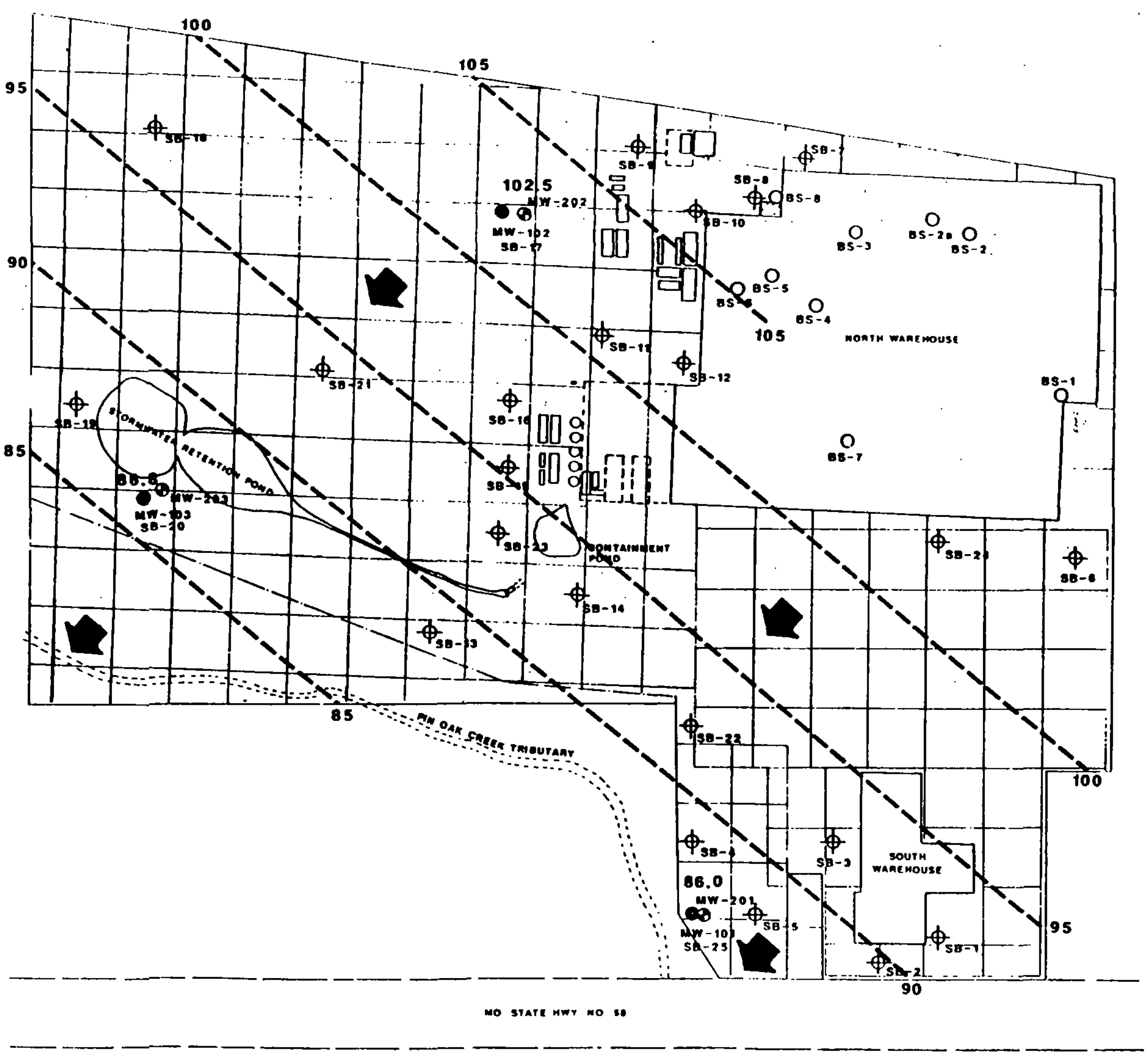
5.3 Site hydrogeology

Groundwater was encountered in both the overburden soils and in the bedrock. These geologic materials were observed to have very low permeabilities as evidenced by the slow recovery of the water levels in the wells after drilling and from the laboratory and in-situ aquifer permeability test results.

The primary occurrence of groundwater on-site was in the zone immediately overlying bedrock. It is probable that shallow groundwater flow is controlled by the bedrock/erosional surface and the ground surface, both which slope to the southwest. Figure 12 presents a representation of the shallow phreatic surface as inferred from water levels in the shallow "200" series wells. This direction shows a high degree of correlation with the bedrock surface map in Figure 9.

In-situ aquifer permeability test results (Table 5) indicate that the shallow zones have hydraulic conductivities in the range of 10^{-4} cm/sec (0.3 feet/day). The shallow groundwater gradient across the site is approximately 0.04 (feet per foot). Groundwater velocity calculated from this is estimated to be approximately 0.23 feet/day assuming an effective porosity of five percent.

The most permeable bedrock units are the lower limestone formations penetrated in each test borehole. These limestones appear to have very low total porosities (six to ten



EXPLANATION

SB-21 SOIL BORINGS

MW-103 SHALLOW MONITORING WELLS

MW-202 DEEP MONITORING WELLS - GEOLOGIC TEST BORING

BS-5 BUILDING SAMPLES

CONCRETE PAD

85 WATER LEVEL ELEVATIONS IN SHALLOW WELLS (7/24/87)

SHALLOW GROUNDWATER FLOW DIRECTION

BS-1 SUMP PIT - BUILDING SECTION 9 - NO SAMPLE TAKEN THIS LOCATION

BS-2a FLOOR JOINT AREA - BUILDING SECTION 2

BS-3 10' SE BAG STORAGE AREA - BUILDING SECTION 3

BS-4 10' WEST OF PIT #2 - BUILDING SECTION 4

BS-5 BROKEN CONCRETE NEAR FLOOR DRAIN TILE - BUILDING SECTION 5

BS-6 20' SOUTH OF PIT #1 - BUILDING SECTION 8

BS-7 10' SOUTH OF STEEL BIN - BUILDING SECTION 6

BS-8 2' WEST OF BUILDING SECTION 11 (OUTSIDE BUILDING AREA)

• BUILDING SECTION NUMBERS CORRESPOND TO CHEMICAL WASTE MANAGEMENT INVENTORY BUILDING SECTION NUMBERS

CONTOUR INTERVAL IS FIVE FEET

DATUM IS AN ON-SITE TEMPORARY BENCH MARK (100')

0 100 200
SCALE IN FEET

N

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SHALLOW GROUNDWATER
PHREATIC SURFACE

12872844	FIGURE 12

Table 5

ROSE CHEMICAL PROJECT
IN-SITU AQUIFER ANALYSIS - TEST RESULTS

LOCATION	TEST TYPE	HYDRAULIC CONDUCTIVITY
Shallow Groundwater Monitoring Wells		
MW-202	Falling Head[1,2]	1.2×10^{-04} cm/sec
MW-203	Rising Head[1,2]	1.1×10^{-04} cm/sec
Deep Groundwater Monitoring Wells		
MW-101	Recovery[2,3]	9.1×10^{-07} cm/sec
MW-102	Recovery[2,3]	2.2×10^{-06} cm/sec
MW-102	Rising Head[1,2]	2.8×10^{-07} cm/sec
MW-103	Recovery[2,3]	4.43×10^{-07} cm/sec

Notes:

1. Hvorslev, M, 1951, Time lag and soil permeability in ground water observations, U.S. Army Corps. of Engineers, Waterways Experimental Station, Bulletin no. 36.
2. Cooper, H, J. Bredehoeft, and I. Papadopulos, 1967, Response of a finite diameter well to an instantaneous charge of water, Water Resources Research, v. 3, no. 1, pp 263-269.
3. Lohman, S, 1972, "Groundwater Hydraulics", U.S. Geological Survey Professional Paper 708.

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percent estimated from neutron and gamma ray logs). This accounts for the slow recharge of the deep screened wells.

Hydraulic conductivities of the zone screened in the deep wells range from 2.8×10^{-7} cm/sec to 2.2×10^{-6} cm/sec. All three deep wells are screened across a zone containing the limestone of interest. Monitoring well MW-103 has ten feet of screen and monitoring wells MW-102 and MW-101 have 20 feet of screen. This accounts for the lower water levels in MW-103. It is our experience that water levels in formations of this magnitude of permeability may sometimes take several months to equilibrate.

5.4 Holden, Missouri area water supply

Information used in the assessment of the Holden, Missouri area public and private water supply was obtained from:

- Missouri Department of Natural Resources, Division of Environmental Quality (Public Drinking Water Program), Jefferson City, Missouri;
- Missouri Department of Natural Resources, Division of Geology and Land Survey, Water Resources, Rolla, Missouri.
- City of Holden utility department, Johnson county water supply district #2; and
- Local (Holden area) water well drillers.

Generally the groundwater in the Holden, Missouri area is considered to be of poor quality. Depending on the direction of the well location from Holden, the primary problems include low yield, high total dissolved solids (TDS), high chlorides, high sulfur, and high sodium. Information obtained from local well drillers indicate that to obtain 15-20 gallons per minute (gpm) from a water well the depths and problems encountered (by area) are:

Direction from Holden, Missouri	Total Well Depth	Problems Encountered
North	400-500 feet	Sulfur and Chlorides ("salt water"), TDS
East	400 feet	Sodium ("soda water"), TDS
South	400 feet	Sulfur, TDS
West	600 feet	Sulfur, TDS

Information obtained from the United States Geological Survey, is in agreement with that obtained from local drillers regarding the low yields and poor quality of groundwater in the area. Table 6 presents a generalized section of geologic and hydrologic units in the vicinity of the site. None of the formations underlying the area are classified as a prolific or high quality aquifer. Specific capacity generally increases with well depth, but the quality of the water also decreases.

Table 6

REGIONAL GENERALIZED HYDROGEOLOGIC SECTION
JOHNSON COUNTY AREA

SYSTEM	SERIES	UNIT	THICKNESS (feet)	LITHOLOGY	AQUIFER CHARACTERISTICS
Pennsylvanian	Des Moines	Marmaton Group Cherokee Group	0-550	Shale, siltstone, sandstone, coal, and limestone.	Locally mineralized. Yields adequate only for domestic purposes (1-3 gpm).
	Atoka	Riverton Formation Burgner Formation	0-90 0-45	Shale, coal. Coal, black siltstone, limestone.	Possible source of small (1-3 gpm) domestic water supplies. Water probably high in dissolved solids.
	Morrow	Hale Formation	0-65	Sandstone.	Found only in Barry County. Not important as an aquifer.
Mississippian	Chester	Fayetteville Shale Batesville Sandstone Hindsville Limestone Carterville Formation	0-200	Shale, limestone, sandstone, siltstone.	Formations do not have wide areal distribution and are, at best, possible sources of small (1-10 gpm) domestic supplies.
	Meramec	Ste. Genevieve Limestone St. Louis Limestone Salem Limestone Warsaw Formation	0-185	Limestone with minor amounts of shale.	Analysis from widely scattered wells indicate that water in these units is highly mineralized (more than 1000 mg/L dissolved solids).
	Osage	Keokuk Limestone Burlington Limestone Elsey Formation Reeds Spring Limestone Pierson Formation	0-400	Limestone, cherty limestone, some dolomite.	Same as above.
	Kinderhook	Northview Shale Sedalia Limestone Compton Limestone Bachelor Formation	0-100	Limestone, cherty limestone siltstone, shale, and sandstone.	Not important as an aquifer.
Devonian	Upper and Middle	Chattanooga Shale Fortune Formation	0-30 0-6	Shale, carbonaceous. Shale, bedded chert, limestone.	Not important as an aquifer.

USGS Water Resources Atlas HA-491, Hydrologic Investigation of West Central Missouri

In Holden, city water is supplied from a man-made lake located two miles east of Holden. The city previously owned a deep well for emergency back-up water supply, last used the well in 1936, and sold the well to a local farmer in 1979. The total depth of the well is 1010 feet and had a capacity of 60 gallons per minute when installed.

A search of the Missouri Department of Natural Resources well logs was conducted. The nearest identified well is located approximately 2 miles south of the site. This well is 568 feet deep and encountered water at 528 feet. An analysis of this water was performed by the Missouri Division of Environmental Quality (1985) and showed the water to be high in sodium (Na: 221 mg/L), high in chlorides (Cl: 142 mg/L) and high in total dissolved solids (TDS: 797).

5.5 Potential migration pathways

The primary pathways for potential migration of contaminants from the site are airborne particles contaminated with PCBs and/or shallow groundwater transport of contaminants to the southwest. This investigation does not address the potential for airborne transport of contaminants from the site.

The most likely transport scenarios for the migration of contaminants to the groundwater environment include:

- o Seepage or discharge from potentially buried on-site wastes migrating laterally to surface seeps or migrating vertically downward to the phreatic surface;

- o Migration of surface contaminants through the vadose zone to the phreatic surface;

- o Migration of surface contaminants laterally with surface water; and,

- o Seepage of contaminant laden fluids through joints or cracks in the warehouse floor to the underlying soils, continuing as discussed above to surface seeps or to groundwater.

5.6 Analytical data evaluation

Analytical data from shallow soils, warehouse shallow soils, and groundwater were evaluated. All analytical tests were conducted by Langston Laboratories of Kansas City, Kansas. The tests performed included volatile organic compounds and PCBs. The PCB tests were run by gas chromatograph using an electron capture detector. The results of the sample analyses were then compared to results from samples of individual standards of the seven primary Aroclors, 1016, 1221, 1232, 1242, 1248, 1254, and 1260. This test also identifies chlordanes and other chlorinated pesticides, if present.

5.6.1 Groundwater data

No PCBs or volatile organic compounds were detected in any of the groundwater samples collected.

5.6.2 Shallow soils data

Table 7 presents results of the analytical testing of on-site shallow soil samples. All samples submitted from any borehole location where any PCBs or VOCs were detected are shown in Table 7. Samples from four locations showed detectable levels of PCBs in the upper 20-inch composite sample. At each of these locations, no detectable levels of PCBs were observed in the 20-inch to 40-inch sample.

Tetrachloroethene (PCE) was the only VOC detected in any shallow soil sample. PCE was detected in the upper 20-inch and the second 20-inch sample from location SB-7 at concentrations of 170 mg/kg and 88.4 mg/kg, respectively. PCE and PCBs were never detected at the same soil borehole location.

Table 7

ROSE CHEMICAL SITE
SHALLOW SOIL SAMPLES
ANALYTICAL RESULTS

	Concentration (mg/kg)									
Parameter	SB-6 (0"-20")	SB-6 (20"-40")	SB-7 (0"-20")	SB-7 (20"-40")	SB-11 (0"-20")	SB-11 (20"-40")	SB-12 (0"-20")	SB-12 (20"-40")	SB-16 (0"-20)	SB-16 (20"-40")
PCBs										
Arochlor 1242	1.70	ND	ND	ND	0.46	ND	57.00	ND	1.90	ND
Arochlor 1260	12.00	ND	ND	ND	2.20	ND	32.00	ND	0.70	ND
Volatile Organics										
1,1-DCE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DCE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-TCA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCE	ND	ND	170.00	8.40	ND	ND	ND	ND	ND	
toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
1. DCE - dichloroethene
2. DCA - dichloroethane
3. TCA - trichlorethane
4. TCE - trichloroethene
5. PCE - tetrachloroethene
6. Only data from those soil borings where contaminants were detected are shown in this table.

5.6.3 Warehouse shallow soil data

Analytical data from the six soil samples obtained through the warehouse floor slab and the one sample (BS-8) taken outside the warehouse immediately west of the bagged core storage room and north of the small outside concrete slab are presented in this section. BS-8 is grouped with the warehouse samples because of the sampling procedure used to obtain it. Unlike the other outside shallow soil samples, BS-8 was taken by hand driving a 24-inch split spoon sampler. This method is similar to the warehouse soil sampling.

Table 8 presents results of the analytical testing of the Main Warehouse shallow soil samples. Results for all samples submitted from any boring location where any PCBs or VOCs were detected are shown in Table 8. PCBs were detected the samples from six of the seven locations. The concentration of PCBs detected ranged from 0.42 mg/kg at BS-8 to 260.0 mg/kg at BS-2A. VOCs were detected in samples from four of the seven locations. The VOCs which were detected and their maximum concentrations include 1,1- and 1,2-dichloroethene (16 mg/kg and 410 mg/kg, respectively), 1,1-dichloroethane (68 mg/kg), 1,1,1-trichloroethane (16 mg/kg), trichloroethene (110 mg/kg), tetrachloroethene (2.7 mg/kg), toluene (49 mg/kg), ethylbenzene (105 mg/kg), and total xylenes (403 mg/kg).

Table 8

ROSE CHEMICAL SITE
WAREHOUSE SOIL SAMPLES
ANALYTICAL RESULTS

Parameter	Concentration (mg/kg)						
	BS-2A	BS-3	BS-4	BS-5	BS-6	BS-7	BS-8
PCBs							
Arochlor 1242	ND	0.80	ND	76.00	44.0	22.00	0.42
Arochlor 1254	260.00	ND	ND	ND	39.0	8.50	0.47
Arochlor 1260	ND	1.50	ND	227.00	ND	ND	
Volatile Organics							
1,1-DCE	ND	ND	1.30	ND	2.70	ND	16.00
1,1-DCA	ND	ND	ND	ND	68.00	ND	2.80
1,2-DCE	ND	ND	8.60	ND	0.37	ND	410.00
1,1,1-TCA	ND	ND	0.47	ND	ND	ND	16.00
TCE	ND	ND	ND	ND	ND	ND	110.00
PCE	ND	ND	ND	ND	ND	ND	2.70
toluene	ND	ND	ND	37.00	ND	ND	49.00
ethylbenzene	ND	ND	ND	105.00	ND	ND	0.90
xylenes	ND	ND	ND	403.00	ND	ND	1.50

Notes:
1. DCE - dichloroethene
2. DCA - dichloroethane
3. TCA - trichlorethane
4. TCE - trichloroethene
5. PCE - tetrachloroethene
6. Only those borings where contaminants were detected are shown in this table.

5.7 Conclusions

The geologic sequence at the site consists of low-permeability clays and shale-residuum overlying low-permeability shales and limestones. A perched aquifer system exists in the shallow soils overlying bedorck. The general flow direction in this perched aquifer is to the southwest.

The uppermost potential bedrock aquifer is the limestone (approximately 10% porosity) unit penetrated at a depth of approximately 25 feet (TB-1 and TB-3) to 40 feet (TB-2).

Significant levels of PCBs exist in the soils underlying the Main Warehouse floor slab in several locations. The vertical and lateral extent of this contamination is not known. At three locations, BS-4, BS-5, and BS-6, volatile organic compounds are also present. The potential for interaction and co-migration of the PCBs and VOCs depends upon the relative age of the two compounds in the soil. If the VOCs predate the PCBs, then the potential for migration of the PCBs is lessened. A potential PCB migration mechanism which still exists is movement of any host oil or fluid which carried the PCBs through the floor slab.

The remainder of the site include areas of documented surface PCBs contamination. The analytical tests indicate that the PCBs in these areas may be limited to the upper few inches of soil. The physical soil tests show permeabilities in the clay soils in the range of 10^{-8} cm/sec. PCB solubility in water is very low (the solubility of Aroclors 1242, 1254, and 1260 range from .057 mg/L to 0.1 mg/L at 24°C). The solubilities of dichloroethene and tetrachloroethene for comparison are 700 mg/L and 150 mg/L respectively. PCBs tend to adsorb to clay and organic soils, and because of their low solubilities tend to remain adsorbed to the surficial clays and organics. If the PCBs are desorbed from the clays, the low permeabilities of the clays will tend to retard their movement. The lack of contaminants in groundwater samples from the on-site wells is therefore reasonable.

The results of both Mathes and Neponset Surface geophysical surveys indicate that no large areas of on-site soil disturbance (trenching, burial) are present. The only area identified in the surface geophysical surveys having a potential for burial of wastes is the area west of the Main Warehouse loading dock. Three apparent drums were identified by GPR (Neponset) in this area.

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX A

Contract/Scope of Work

JULY/87/0083s

ROSE CHEMICAL SITE

AGREEMENT

EXHIBIT B

SCOPE OF SERVICES

The purpose of this work is to achieve a basic understanding of the potential mechanisms for transportation of contamination in the subsurface environment and distribution of existing/known PCB contamination. In order to accomplish these goals, a program of physical and chemical investigation of the soils and the hydrogeologic regime shall be developed. The Scope of Work that follows specifies the various tasks required to complete this evaluation of the site.

SCOPE OF WORK

A. A geophysical survey of the site shall be performed prior to commencement of subsurface investigations. The geophysical survey shall consist of at least a series of magnetometer traverses and electromagnetic traverses. If any large anomalies are discovered a ground penetrating radar survey may be requested for the area.

1. A soil gas survey shall be conducted at the site. This survey shall consist of sampling at points suspected of being "hot spots", areas of surficial soil disturbance in low topographic areas in anomalous areas determined from the geophysical survey, and at random points in other areas of the site.

2. Drill and geophysically log 6 boreholes at the site.

   These holes shall penetrate into the bedrock with at least one boring penetrating approximately 50 feet. The boreholes shall be geophysically logged by natural gamma, neutron and resistivity methods to determine the geology, the depth to water and the approximate thickness of the saturated zone. After logging, the boreholes shall be plugged, except when used in monitoring system, in a manner approved by the Missouri Department of Natural Resources.

3. Based upon the results of the above tasks, a piezometer/monitoring well system shall be designed for the site. This system shall be designed to allow accurate measurement of the horizontal water table gradient and allow collection of samples from the uppermost saturated zone and, if appropriate, the other zones of concern. Depending upon the geology at the site, wells may need to be installed to assess other zones of concern. Wells shall be constructed of at least Schedule 40, flush threaded, 2-inch I.D., PVC. Well screens shall also be constructed of wound or mill slotted, Schedule 40, PVC. The length of screen and the slot size shall be determined in the field. No adhesive of any kind will be allowed in the well construction.

Approximately 6 piezometer/monitoring wells are anticipated.

4. Each piezometer/monitoring well shall be developed to the extent that representative samples of the ground water can be obtained and that a slug or pumping test can be performed in them to determine in situ hydraulic conductivity.

5. Ground water samples shall be obtained from each piezometer/monitoring well for analysis. Wells shall be sampled in replicate based upon the following: a) every sixth well and b) the last well sampled. One sample shall be taken from each well and at least one duplicate shall be taken from one well. Samples shall be taken in an approved manner which will include removing water from the well until the pH and conductivity of the water stabilizes prior to taking the sample.

6. Soil and ground water samples shall be analyzed for PCBs, by SW-846, 3rd Edition, Method 8080 and halogenated volatile organics by SW-846, 3rd Edition, Method 8010.

B. Soil borings shall be conducted on site to determine the areal and vertical extent of potential contamination.

1. Borings shall consist of continuous sample collection with a continuous tube sample. It is anticipated that the borings will average about 5 feet in depth. Borings shall be taken at suspected "hot spots", at locations where there is evidence of surface disturbance, low topography, suspect areas located by surface geophysical methods and in other areas on a random or grid basis. The total number of soil borings is not known at this time, but as many as 20 are estimated.

2. Each sample shall be split longitudinally, and at least 3 composite samples shall be taken from the top, middle and bottom third of the sample. The top and middle subsample shall be analyzed. The remaining half and the bottom third shall be preserved in an approved manner and retained on site by the CSI PM.

3. The boreholes shall be plugged in an approved manner.

4. Cores of the building floor shall be made to allow the sampling of the foundation material beneath the floor. It is anticipated that approximately six borings will be made with a standard, concrete floor coring machine or an approved equivalent. Samples of the foundation material from beneath the concrete shall be taken by using a hand-driven sampling tube or approved equivalent to a depth of at least 18 inches. Subsequent to removal of the soil core, a soil gas measurement shall be made in the boring. It is not anticipated that the concrete core will be analyzed. Borings will be plugged by filling the sample void with clean sand, reinserting the concrete core and grouting it in with a lean cement grout.

C. All equipment shall be decontaminated prior to site work, between each boring location and prior to removal from the site.

D. CONTRACTOR's health and safety officer shall determine the appropriate level of personal protection for workers at the site.

E. All samples shall be sent to Langston Laboratories, 2005 W. 103rd Terrace, Leawood, Kansas. Langston Laboratories will bill CSI directly for all analysis work. Coordination and expediting of analysis results shall be the responsibility of the CONTRACTOR. Sample jars shall be provided by the Laboratory.

F. The CONTRACTOR shall prepare a budget for the Scope of Services above based on the unit rates presented in the Proposal submitted May 12, 1987.

G. CONTRACTOR shall develop the following Work Plans (for CONTRACTOR's Scope of Work):

1. Health and Safety (H&S)

2. Quality Assurance/Quality Control (QA/QC)

3. Sampling/Analysis

Some on-site work will be performed by CONTRACTOR prior to development of Work Plans.

H. Site specific Emergency Response Contingency, and Spill Prevention Control and Countermeasure (SPCC) Plans will be provided to the CONTRACTOR by CSI. The QA/QC Plan for Langston Laboratories will also be provided by CSI.

END EXHIBIT

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX B

Soil Gas Report

Tracer Research Corporation

3855 North Business Center Drive Tucson, Arizona 85705 (602) 888-9400

SHALLOW SOIL GAS INVESTIGATION
AT A
ROSE CHEMICAL FACILITY
HOLDEN, MISSOURI

JUNE, 1987

PREPARED FOR:

John Mathes & Associates, Inc.
210 West Sand Bank Road
Columbia, Illinois 62236

SUBMITTED BY:

D.D. Evans

Tracer Research Corporation

TABLE OF CONTENTS

INTRODUCTION

A shallow soil gas investigation was conducted by Tracer Research Corporation at a Rose Chemical facility in Holden, Missouri. The investigation was conducted June 3-5, 1987 under contract to John Mathes & Associates, Inc.

For this survey, a total of 39 soil gas samples were taken and analyzed for the following volatile organic compounds:

1,1,1-Trichloroethane (TCA)
Trichloroethene (TCE)
Tetrachloroethene (PCE)
Benzene
Toluene
Xylenes
Total Hydrocarbons

Operational problems prohibited the analysis of benzene, toluene, xylenes and total hydrocarbons on June 5.

Analytical data is summarized in Appendix A. Appendix B contains sampling notes and Figure 1 (attached) is a map of sampling locations.

BACKGROUND ON THE METHODOLOGY

The presence of volatile organic chemicals (VOCs) in shallow soil gas indicates the observed compounds may either be in the vadose zone near the probe or in groundwater below the probe. The soil gas technology is most effective in mapping low molecular weight halogenated solvent chemicals and petroleum hydrocarbons possessing high vapor pressures and low aqueous solubilities. These compounds readily partition out of the groundwater and into the soil gas as a result of their high gas/liquid partitioning coefficients. Once in the soil gas, VOCs diffuse vertically and horizontally through the soil to the ground surface where they dissipate into the atmosphere. The contamination acts as a source and the above ground atmosphere acts as a sink, and typically a concentration gradient develops between the two. The concentration gradient in soil gas between the source and ground surface may be locally distorted by hydrologic and geologic anomalies (e.g. clays, perched water); however, soil gas mapping generally remains effective because distribution of the contamination is usually broader in areal extent than the local geologic barriers and is defined using a large data base. The presence of geologic obstructions on a small scale tends to create anomalies in the soil gas-groundwater correlation, but generally does not obscure the broader areal picture of the contaminant distribution.

SAMPLING AND ANALYTIC PROCEDURES

Tracer Research Corporation utilized an analytical field van which was equipped with two gas chromatographs and two Spectra Physics SP4270 computing integrators. In addition, the van has two built-in gasoline powered generators which provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes. Probes consist of 7-foot lengths of 3/4 inch diameter steel pipe which are fitted with detachable drive points. A hydraulic hammer was used to assist in driving probes past cobbles and through unusually hard soil.

Soil gas samples were collected by driving a hollow steel probe to a depth between 1.5 feet and 5.5 feet into the ground. The above-ground end of the sampling probes was fitted with a steel reducer and a length of polyethylene tubing leading to a vacuum pump. Five to 10 liters of gas was evacuated with a vacuum pump. During the soil gas evacuation, samples were collected by inserting a syringe needle through a silicone rubber segment in the evacuation line and down into the steel probe. Ten milliliters of gas were collected for immediate analysis in the TRC analytical field van. Soil gas was subsampled (duplicate injections) in volumes ranging from 1 ul to 2 ml, depending on the VOC concentration at any particular location.

A gas chromatograph equipped with an electron capture detector was used for analyses of TCA, TCE and PCE. Nitrogen was used as the carrier gas. A second gas chromatograph, equipped with a flame ionization detector, was used for analyses of benzene, toluene, xylenes, and total hydrocarbons. Total hydrocarbons are C3-C9 aliphatic, aromatic and alicylic compounds.

Detection limits are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the detector. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses. The detection limits range down to 0.00005 ug/l for compounds such as TCA and PCE depending on the conditions of the measurement, in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.0001 ug/l). This number is calculated from the current response factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of soil gas samples.

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. Enough probes are carried on each van to avoid the need to reuse any during the day.

- Probe adaptors (steel reducer and tubing) are used once during the course of the day and cleaned at the end of each working day by baking in the GC oven. The tubing is replaced periodically as needed during the job to insure cleanliness and good fit.

- Silicone tubing (connecting the adaptor to the vacuum pump) is replaced as needed to insure proper sealing around the syringe needle. This tubing does not directly contact soil gas samples.

- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.

- Septa through which soil gas samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.

- Analytical instruments are calibrated each day by the use of chemical standards prepared in water by serial dilution from commercially available pure chemicals. Calibration checks are also run after approximately every five soil gas sampling locations.

- 2 cc subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.

- Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10 cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled air analysis.

- All sampling and 2 cc subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.

- Soil gas pumping is monitored by a vacuum gauge to insure that an adequate gas flow from the vadose zone is maintained. A negative pressure (vacuum) of 2 in. Hg less than the maximum capacity of the pump (evacuation rate >0.02 cfm) usually indicates that a reliable gas sample cannot be obtained because the soil has a very low air permeability.

APPENDIX A: CONDENSED DATA

Tracer Research Corporation

JOHN MATHES & ASSOCIATES-ROSE CHEMICAL-HOLDEN, MISSOURI

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Xylene (ug/l)	Total Hydroc. (ug/l)
SG01	1.5'	06/03	0.02	0.004	0.002	<0.04	<0.04	<0.05	<0.04
SG02	2'	06/03	0.005	0.002	0.0008	<0.04	<0.04	<0.05	<0.04
SG03	2.5'	06/03	0.02	0.007	0.0004	<0.04	<0.04	<0.05	<0.04
SG04	3'	06/03	0.02	0.007	0.004	0.2	0.2	<0.05	0.4
SG05	2'	06/03	0.01	0.002	<0.00004	<0.04	<0.04	<0.05	<0.04
SG06	1.5'	06/03	0.002	0.006	<0.00009	<0.08	<0.08	<0.09	<0.08
SG07	3'	06/03	0.03	0.005	<0.00009	<0.04	<0.04	<0.05	<0.04
SG08	1.5'	06/03	0.0006	0.002	0.01	<0.08	<0.08	<0.09	<0.08
SG09	2'	06/03	1	0.01	0.3	<0.08	<0.08	<0.09	<0.08
SG10	2.5'	06/03	2	30	4	<0.08	<0.08	<0.09	16
SG11	1.5'	06/03	0.8	2	0.6	<0.08	<0.08	<0.09	1
SG12	1.5'	06/03	0.008	0.06	0.08	<0.08	<0.08	<0.09	<0.08
SG13	2'	06/03	3	45	2	<0.08	<0.08	<0.09	21
SG14	1.5'	06/04	0.002	<0.0003	<0.00009	<0.04	<0.04	<0.04	<0.04
SG15	1.5'	06/04	0.002	<0.0003	0.0001	<0.04	<0.04	<0.04	<0.04
SG16	1.5'	06/04	0.002	<0.0003	<0.0005	0.4	0.2	<0.04	1
SG17	2.5'	06/04	0.002	<0.0003	0.0004	<0.04	<0.04	<0.04	<0.04
SG18	3'	06/04	0.002	<0.0003	<0.0009	<0.04	<0.04	<0.04	<0.04
SG19	2.5'	06/04	0.006	<0.002	0.2	<0.04	<0.04	<0.04	<0.04
SG20	1.5'	06/04	0.0005	0.001	0.0004	<0.07	<0.08	<0.09	<0.07
SG21	2.5'	06/04	0.0006	<0.0003	<0.00009	<0.07	<0.08	<0.09	<0.07
SG22	2'	06/04	0.002	<0.0003	0.006	<0.04	<0.04	<0.04	<0.04
SG23	3'	06/04	0.002	0.4	0.2	22	4,200	12,000	14,000
SG24	4'	06/04	0.001	0.001	<0.0002	N/A	N/A	N/A	N/A
SG25	1.5'	06/05	0.002	0.006	<0.00008	N/A	N/A	N/A	N/A
SG26	1.5'	06/05	0.0006	<0.0003	0.0002	N/A	N/A	N/A	N/A
SG27	4'	06/05	0.2	0.1	2	N/A	N/A	N/A	N/A
SG28	5.5'	06/05	0.02	0.0007	0.002	N/A	N/A	N/A	N/A

Notations:
I   interference with adjacent peaks
NA   not analyzed

Analyzed by ___M. Favero________

Checked by ___S. Cherba________

[illegible] by L. Laplander

Tracer Research Corporation

MATHES & ASSOCIATES-ROSE CHEMICAL-HOLDEN MISSOURI

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Xylenes (ug/l)	Total Hydrocarbons (ug/l)
SG29	5'	06/05	0.008	0.002	0.001	N/A	N/A	N/A	N/A
SG30	5.5'	06/05	0.001	0.002	0.0006	N/A	N/A	N/A	N/A
SG31	5'	06/05	0.002	0.002	0.0005	N/A	N/A	N/A	N/A
SG32	5'	06/05	0.001	0.002	<0.00008	N/A	N/A	N/A	N/A
SG33	5'	06/05	0.001	0.002	<0.00008	N/A	N/A	N/A	N/A
SG34	5'	06/05	0.002	0.002	0.001	N/A	N/A	N/A	N/A
SG35	5'	06/05	0.001	0.0008	0.0006	N/A	N/A	N/A	N/A
SG36	4'	06/05	0.0007	<0.0003	<0.00008	N/A	N/A	N/A	N/A
SG37	5'	06/05	0.0007	<0.0003	<0.00008	N/A	N/A	N/A	N/A
SG38	5'	06/05	0.001	0.001	0.0004	N/A	N/A	N/A	N/A
SG39	5'	06/05	0.002	0.002	0.0003	N/A	N/A	N/A	N/A

Notations:
I   interference with adjacent peaks
NA   not analyzed

Analyzed by M. Favero

Checked by S. Cherba

Proofed by J. Laplander

Tracer Research Corporation

MATHES & ASSOCIATES/ROSE CHEMICAL/HOLDEN, MISSOURI

Sample	Time	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)
N2 Blk	10:04	06/03	<0.00007	<0.0001	<0.00001
N2 Blk	8:16	06/04	0.005	0.003	0.0002
N2 Blk	7:59	06/05	<0.0001	<0.0003	<0.00008
Air Sample	10:15	06/03	0.007	0.0006	0.0002
Air Sample	13:44	06/03	0.004	0.0001	<0.00001
Air Sample	17:50	06/03	0.0008	0.003	<0.00001
Air Sample	8:16	06/04	0.005	0.003	0.0002
Air Sample	11:14	06/04	0.0002	0.0005	<0.00009
Air Sample	8:03	06/05	0.0006	<0.0003	<0.00008
Air Sample	13:16	06/05	0.0006	<0.0003	<0.00008
Air Sample	14:14	06/05	0.0004	0.0003	<0.00008
System Blk	10:51	06/03	0.003	0.002	0.0002
System Blk	8:51	06/04	0.002	0.002	0.0002
System Blk	9:08	06/05	0.0005	<0.0003	<0.00008

Notations:
I   interference with adjacent peaks
NA   not analyzed

Analyzed by M. Favero

Checked by S. Cherba

MATHES & ASSOCIATES/ROSE CHEMICAL/HOLDEN, MISSOURI

Tracer Research Corporation

Sample	Time	Date	Benzene (ug/l)	Toluene (ug/l)	Xylene (ug/l)	Total Hydroc as CH4 (ug/l)
N2 Blk	10:05	06/03	0.04	<0.04	<0.05	<0.04
N2 Blk	8:04	06/04	<0.04	0.04	0.04	0.04
Air Sample	10:15	06/03	<0.04	0.04	[illegible]	0.04
Air Sample	17:44	06/03	0.04	0.04	<0.05	<0.04
Air Sample	17:46	06/03	<0.04	0.04	<0.05	<0.04
Air Sample	8:08	06/04	<0.04	<0.04	<0.04	0.04
Air Sample	11:15	06/04	<0.04	0.04	<0.04	0.04
System Blk	10:51	06/03	<0.04	<0.04	<0.05	0.04
System Blk	8:51	06/04	<0.04	0.04	<0.04	<0.04

Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by M. Favero

Checked by S. Cherba

APPENDIX B: SAMPLING NOTES

MATHES & ASSOCIATES

ROSE CHEMICAL

HOLDEN, MISSOURI
JUNE 3-5, 1987

Sample	Notes
SG01	#1 - push to 3'; water 3' to 1-1/2'; no sample; moved
SG02-2'	Push to 2'
SG03-2 1/2'	Push to 3'; flow at 2 1/2'
SG04-3'	Push to 3'
SG05-2'	#1-Push to 3'; no flow 3' to 1 1/2'; moved #2, #3 - pound to 1 1/2'; stopped by clients over concern about underground utilities #4-push to 3'; flow at 2'

No sample collected at proposed location 26 on field map
Started pounding at schedule 80 probe; began bending at 1 1/2'
no flow

Sample	Notes
SG06-1 1/2'	Push to 3'; flow at 1 1/2'
SG07-3'	Push to 3'
SG08-1 1/2'	#1 & #2-Push to 3'; no flow 3' to 1 1/2' #3-Push to 1 1/2'; probe started bending when pounded at 1 1/2'
SG09-2'	Push to 1 1/2'; pound to 2'; probe stopped at 2'
SG10-2 1/2'	Push to 3'; flow at 2 1/2'

No sample collected at proposed location 47 on field map
#1-Water at 1' #2-No flow at 1 1/2'

SG11-1 1/2'	#1-Push to 3'; water at 2' #2-Stopped at 2'; no flow #3-Push to 3'; flow at 1 1/2'
SG12-1 1/2'	Push to 3'; flow at 1 1/2'
SG13-2'	Push to 3'; flow at 2'
SG14-1 1/2'	Push to 3'; flow at 1 1/2'
SG15-1 1/2'	Push to 3'; flow at 1 1/2'
SG16-1 1/2'	Push to 1'; pound to 1 1/2' and stopped
SG17-2 1/2'	#1-Push to 3'; no flow 3' to 1' #2-Push to 3'; flow at 2 1/2'
SG18-3'	Push to 3'
SG19-2 1/2'	Pound to 1/2';push to 3';flow at 2 1/2'
SG20-1 1/2'	Push to 3'; flow at 1 1/2'
SG21-2 1/2'	Push to 3'; flow at 2 1/2'
SG22-2'	#1 & #2-Push to 3'; no flow 3' to 1' #3-Push to 3'; flow at 2'
SG23-3'	#1 & #2-Push to 3'; no flow 3' to 1' #3-Push to 1'; pound to 1 1/2'; push to 3'
SG24-4'	Push to 2'; pound to 4'; stopped and probe bent at 4'
SG25-1 1/2'	Push to 6'; flow at 1 1/2'
SG26-1 1/2'	Push to 6'; flow at 1-1/2'
SG27-4'	Pound to 1'; push to 6'; flow at 4'

No sample collected at proposed sample location 1 on field map
3 attempts; push to 6'; no flow between 6' & 1-1/2'

SG28-5-1/2'	Push to 6'; flow at 5-1/2'
SG29-5-1/2'	Push to 6'; flow at 5-1/2'

SG30-5-1/2'	Pound to 1'; push to 6'; flow at 5-1/2'
SG31-5'	Push to 6'; flow at 5'
SG32-5'	Push to 6'; flow at 5'
SG33-5'	Push to 6'; flow at 5'
SG34-5'	Push to 6'; flow at 5'
SG35-5'	Push to 6'; flow at 5'
SG36-4'	Pound to 1/2'; push to 4'
SG37-5'	Push to 6'; flow at 5'
SG38-5'	Push to 6'; flow at 5'
SG39-5'	Push to 6'; flow at 5'

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX C

Geologic Test Borehole Logs and
Groundwater Monitoring Well Construction Diagrams

JULY/87/0083s

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. TB1/SB25/MW-101

DATE 6/10-12/87 **PROJECT NO.** 12872844

PROJECT Rose Chemical **JMA CONTRACT NO.** N/A

LOCATION West of South Warehouse **L.S. ELEV.** 94.5'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE DESCRIPTIONS	Qp	REMARKS
	1	0.0	CTS		0-4.5' dark brown silty sandy clay; trace gravel; rooted; strace Fe stains; CL	3.5	1-TB1-1-Chemical Analysis
	2	4.5	CTS	2.9'		2.3	2-TB1-2 Chemical Analysis
5		4.5			4.5-9.5' gray brown silty sandy clay w/gravel; Fe stains; charcoal material from 6.0' down; CL	1.5 1.25	
	3	9.5	CTS	4.5'		.8	3-Physical Test-TB1-P1
10		9.5		5.0'	9.5-14.5' S.A.A. -heavily oxidized zone 12.5-~~13~~'; increase gravel to 13'		
	4	14.5	CTS		13.0-14.5' SHALE-gray green; dry, friable	2.2 3.0 4.5+	4-TB1-P2-Physical Test -set 4" PVC casing @ 14.5'
15		14.5			14.5-15.5' gray green shale w/L.S. Fragments		
		18.2	NW	3.25'	15.5-18.2' gray green L.S. w/shale inclusions; highly fractured		NX Wireline coring 14.5-48.2'
20			NW	9.0'	18.2'-dark gray shale		
25		26.2			26.5'-gray green shaley LIMESTONE; fractured w/shale filled voids		26.4'-Rob barrel due to swelling shale
30		28.2	NW	10.0'	28.2'-green gray shaley L.S. 30'-light gray L.S. w/thin gray shale partings		
35					34'-Interbedded shale and L.S.; shale weathered, L.S. very slightly weathered		

DRILLING METHOD NX Wireline/4¼" Hollow Stemmed Augers
DATE DRILLED 6/10-12/87
DRILLED BY C. Hebel
LOGGED BY T. Fuhrhop
PIEZOMETER Yes
WI SERIAL # N/A

GROUNDWATER LEVELS

___ Encountered at ___ feet
___ Hours after completion ___ feet
___ " after completion ___ feet
___ " after completion ___ feet

GEOLOGIST'S SIGNATURE ________

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. TB1/SB25/MW-101

DATE 6/10-12/87 PROJECT NO. 12[illegible]44

PROJECT Rose Chemical JMA CONTRACT NO. N/A

LOCATION West of South Warehouse L.S. ELEV. 94.5'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE DESCRIPTIONS	Qp	REMARKS
		38.2			37.2'-gray sandy L.S.-sandstone with thin gray shale partings		
40		38.2			38.2'-light gray shaley L.S. 39.25'-dark gray shale; slightly weathered at 47'		
				10.0'			
			NW				
45							
		48.2			TOB @ 48.2'		
50							Hole reamed to 50' for geophysical testing
55							
60							
65							
70							

DRILLING METHOD NX Wireline / 4¼" Hollow-stemmed augers

DATE DRILLED 6/10-12/87

DRILLED BY C. Hebel

LOGGED BY T. Fuhrhop

PIEZOMETER Yes

WI SERIAL # NA

GROUNDWATER LEVELS

___ Encountered at ___ feet

___ Hours after completion ___ feet

___ " after completion ___ feet

___ " after completion ___ feet

GEOLOGIST'S SIGNATURE ________

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. TB2/SB17/MW-102

DATE 6/14-15/87 PROJECT NO. 12872844

PROJECT Rose Chemical JMA CONTRACT NO. N/A

LOCATION West of Main Warehouse L.S. ELEV. 106.1'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE DESCRIPTIONS	Qp	REMARKS
	1	0.0			0-1'-gravel fill 1-1.5'-CL gray brown; mottled; Fe stains; trace gravel; stiff; black charcoal material near bottom		1-TB2-1-Chemical Analysis
	2		CTS	4.5'			2-TB2-2-Chemical Analysis
		4.5					
5	3		CTS				3-Physical testing TB2-P1
				3.5'	4.5-9.5' gray brown shale; very weathered; trace gravel; zones of Fe staining		
	4	9.5	CTS				4-TB2-4-Chemical Analysis
10	5	9.5 12.0	CTS	2.5'	9.5-12.0' gray shale w/interbedded clay shale zones (0.2-0.3')		5-TB2-5-Chemical Analysis 4" PVC casing set @ 12.0'
		12.0			12.0-18.5' dark gray shale thin bedded		NX Wireline coring 12.0-18.5'
15			NW	6.5'			
		18.5			18.5-19.1' dark gray shale 19.1-19.9' coal 19.9-25.9' gray clay-shale; weathered		
		18.5					
20			NW	9.0'			
25					25.9-27.7'-S.A.A. w/interbedded hard gray shale-thin beds		
		28.5			27.7-28.5' interbedded gray shale and light gray L.S. 28.5 - 34.0' dark gray weathered shale w/some interbedded L.S. layers		
		28.5					
30							
			NW	6.5'	34.0-36.1'-light gray L.S. -no weathering-some vugs		
35							

DRILLING METHOD NX Wireline/4¼" Hollow Stemmed Augers

DATE DRILLED 6/14-15/87

DRILLED BY C. Hebel

LOGGED BY T. Fuhrhop

PIEZOMETER Yes

WI SERIAL # N/A

GROUNDWATER LEVELS

____ Encountered at ______ feet

____ Hours after completion ______ feet

____ " after completion ______ feet

____ " after completion ______ feet

GEOLOGIST'S SIGNATURE ____________

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. TB2/SB17/MW-102

DATE	6/14-15/87	**PROJECT NO.**	12872844
PROJECT	Rose Chemical	**JMA CONTRACT NO.**	N/A
LOCATION	West of Main Warehouse	**L.S. ELEV.**	106.1'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE DESCRIPTIONS	Qp	REMARKS
					36.1-38.5' dark gray shale-some weathering-friable		
		38.5					
		38.5			38.5-43.3' dark gray shale some weathering-a few thin interbedded L.S. layers		
40							
			NW	9.6'	43.3-48.5'-light gray L.S.		Signs of weathering 43.3-44.8'
45							
		48.5					
					TOB @ 48.5'		
50							
55							
60							
65							
70							

DRILLING METHOD NX Wireline/14¼" Hollow Stemmed Augers
DATE DRILLED 6/14-15/87
DRILLED BY C. Hebel
LOGGED BY T. Fuhrhop
PIEZOMETER Yes
WI SERIAL # N/A

GROUNDWATER LEVELS

____ **Encountered at** ____ **feet**
____ **Hours after completion** ____ **feet**
____ **" after completion** ____ **feet**
____ **" after completion** ____ **feet**

GEOLOGIST'S SIGNATURE __________

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. TB3/SB20/MW-103

DATE 6/9-10/87 **PROJECT NO.** 12872844

PROJECT Rose Chemical **JMA CONTRACT NO.** N/A

LOCATION South of Stormwater Retention Pond **L.S. ELEV.** 88.8'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE DESCRIPTIONS	Qp	REMARKS
	1	0.0			0-4.5' gray brown silty sandy clay w/trace gravel; Fe stains; rooted; CL		1-TB3-1-Chemical Analysis
	2		CTS	4.5'		3.75	2-TB3-2-Chemical Analysis
	3	4.5					3-TB3-P1-Physical Sample
5		4.5			4.5-9.5' gray brown silty clay; trace sand & gravel-more sand w/depth; Fe stains; black charcoal material visible @ 8.0'; CL	2.5	
	4		CTS	5.0'		2.25	4-TB3-P2-Physical Sample
		9.5				2.75	
10		9.5			S.A.A.	1.75	
			CTS	5.0'		2.5	
		14.5			13.5' yellow brown-dark gray friable shale	4.25	
15		14.5	CTS	1.5'	14.5-17.5' dark gray shale-dry; very friable-dusty		
		17.5					4" PVC casing set to 17.5'
		17.5 18.2	CTS	.5	17.5-18.2' gray shale-L.S. fragments		
		18.2			18.2-20.3' dark gray shale		
20				9.75'	20.3-22.0' interbedded shale & light gray L.S.		
			NW		22.0-27.9' gray L.S.; few fractures; few shale stingers		NX Wireline coring 18.2-47.7'
25							
		28.2			27.9-28.2' interbedded L.S. & dark gray shale		
		28.2			28.2-29.2' interbedded L.S. & shale; high percentage of pyrite in shale		
30					29.2-31.3' dark gray shale; some L.S. nodules		
			NW		31.3-33.9' gray green sandstone w/shale lenses		
				9.5'	33.9-38.2' sandy shale; dark gray; sandy partings fine layering		
35							

DRILLING METHOD NX Wireline/4¼" Hollow Stemmed Augers
DATE DRILLED 6/9-10/87
DRILLED BY C. Hebel
LOGGED BY T. Fuhrhop
PIEZOMETER Yes
WI SERIAL # N/A

GROUNDWATER LEVELS
____ Encountered at ____ feet
____ Hours after completion ____ feet
____ " after completion ____ feet
____ " after completion ____ feet

GEOLOGIST'S SIGNATURE ____________

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. TB3/SB20/MW-103

DATE 6/9-10/87 **PROJECT NO.** 12872844

PROJECT Rose Chemical **JMA CONTRACT NO.** N/A

LOCATION South of Stormwater Retention Pond **L.S. ELEV.** 88.8'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE DESCRIPTIONS	Qp	REMARKS
		38.2					
40		38.2	NW	10.0	38.2-39.9' dark gray shale no fractures @ weathering 39.9-42.3' dark gray shale highly weathered 42.3-47.7' L.S.-weathered; brown gray; vugs; some thin shale partings-few fractures		.5' missing from 28.2'-38.2' run was recovered in next run
45		47.7					
					TOB 47.7'		
50							
55							
60							
65							
70							

DRILLING METHOD NX Wireline /4¼" Hollow-Stemmed Augers
DATE DRILLED 6/9-10/87
DRILLED BY C. Hebel
LOGGED BY T. Fuhrhop
PIEZOMETER Yes
WI SERIAL # N/A

GROUNDWATER LEVELS

___ Encountered at ___ feet
___ Hours after completion ___ feet
___ " after completion ___ feet
___ " after completion ___ feet

GEOLOGIST'S SIGNATURE ___

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. MW201

DATE	6-24-87	**PROJECT NO.**	12872844
PROJECT	Rose Chemical	**JMA CONTRACT NO.**	N/A
LOCATION	West of south Warehouse	**L.S. ELEV.**	95.2'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE DESCRIPTIONS	Qp	REMARKS
0					0.0-13.2'-No Samples-drilled w/augers & centerplug. See TBI/SB25 for geologic description.		
5							
10							
					13.2'-Auger refusal TOB @ 13.2'		
15							
20							
25							
30							
35							

DRILLING METHOD 4¼" Hollow Stemmed Augers
DATE DRILLED 6-24-87
DRILLED BY C. Hebel
LOGGED BY T. Fuhrhop
PIEZOMETER Yes
WI SERIAL # N/A

GROUNDWATER LEVELS
____ Encountered at ________ feet
____ Hours after completion ________ feet
____ " after completion ________ feet
____ " after completion ________ feet

GEOLOGIST'S SIGNATURE ____________________

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. MW202

DATE 6-27-87

PROJECT NO. 12872844

PROJECT Rose Chemical

JMA CONTRACT NO. N/A

LOCATION West of Main Warehouse

L.S. ELEV. 106.1'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE DESCRIPTIONS	Qp	REMARKS
					Drilled w/augers & centerplug; No samples taken; See TB2/SB17 log for geologic description.		
5							
10							
15							
20					Auger refusal @ 20.5' TOB @ 20.5'		
25							
30							
35							

DRILLING METHOD 4¼" Hollow Stemmed Augers

DATE DRILLED 6-27-87

DRILLED BY C. Hebel

LOGGED BY T. Fuhrhop

PIEZOMETER Yes

WI SERIAL # N/A

GROUNDWATER LEVELS

___ Encountered at ___ feet

___ Hours after completion ___ feet

___ " after completion ___ feet

___ " after completion ___ feet

GEOLOGIST'S SIGNATURE ___

JOHN MATHES & ASSOCIATES, INC.

GEOLOGIC LOG FOR BORING NO. MW-203

DATE 6-25-87 **PROJECT NO.** 12872844

PROJECT Rose Chemical **JMA CONTRACT NO.** N/A

LOCATION South of Stormwater Retention Pond **L.S. ELEV.** 89.1'

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL (ft)	SAMPLE TYPE	SAMPLE RECOVERY (in)	SAMPLE DESCRIPTIONS	Qp	REMARKS
0–5					0-18.8' drilled w/augers & centerplug. No samples taken. See TB3/SB20 for geologic description.		
5–10					Driller's Note: 11.5'-more difficult drilling-TOR-fractured L.S. ? 14.0' top of shale; Cutting very slow @ 19.0'; Decided to set well.		
15–20					TOB @ 18.8'		
25							
30							
35							

DRILLING METHOD 4¼ Hollow Stemmed Augers
DATE DRILLED 6-25-87
DRILLED BY C. Hebel
LOGGED BY T. Fuhrhop
PIEZOMETER Yes
WI SERIAL # N/A

GROUNDWATER LEVELS
____ Encountered at ____ feet
____ Hours after completion ____ feet
____ " after completion ____ feet
____ " after completion ____ feet

GEOLOGIST'S SIGNATURE ____________

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX D

Geophysical Well Logs

JULY/87/0083s

BPB

GAMMA RAY
DUAL NEUTRON LOG

BOREHOLE TB-1

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

DATE LOGGED 13 JUNE 87

DEPTH SCALE 1" : 2'

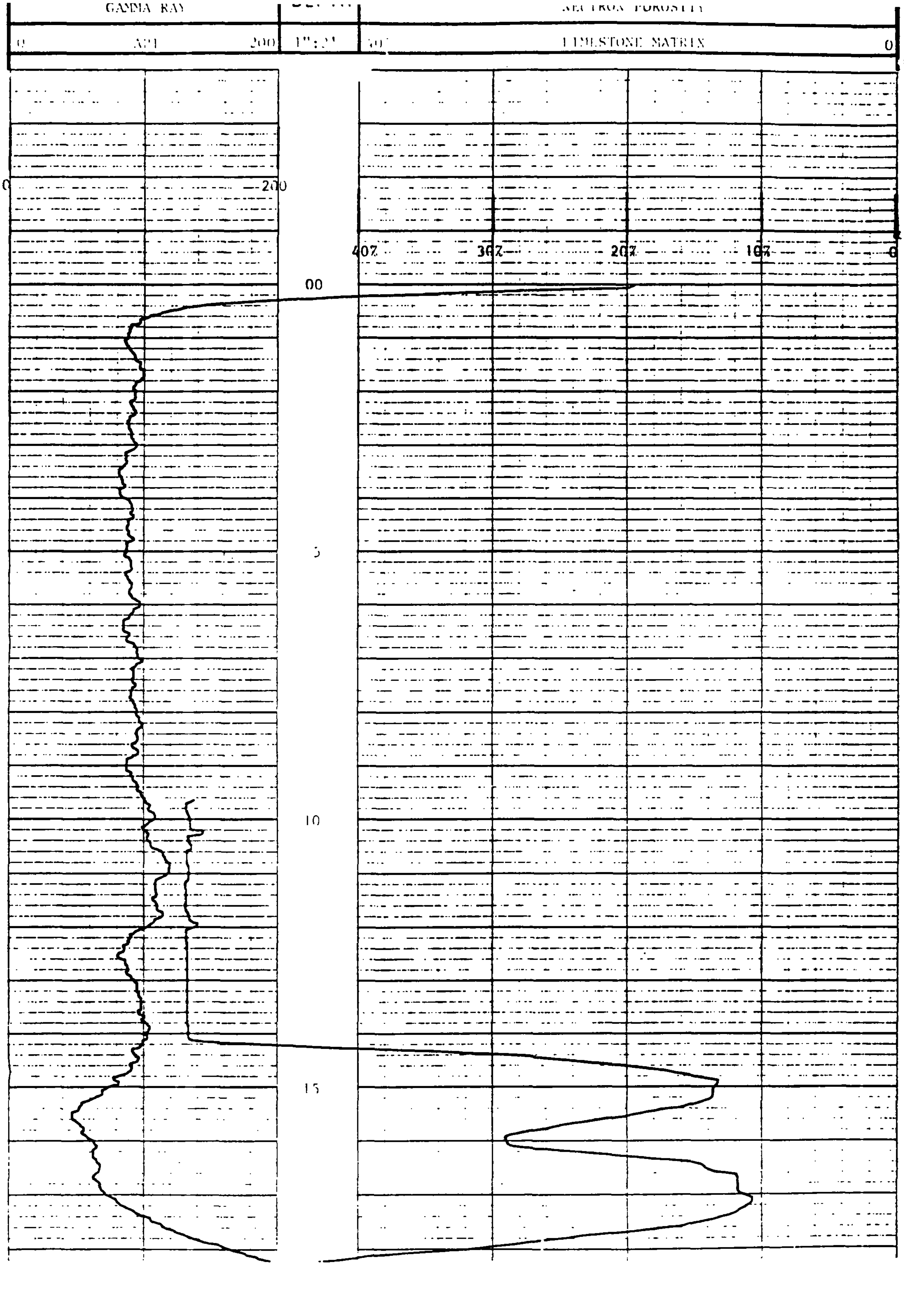
2 OF 3 LOGS

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

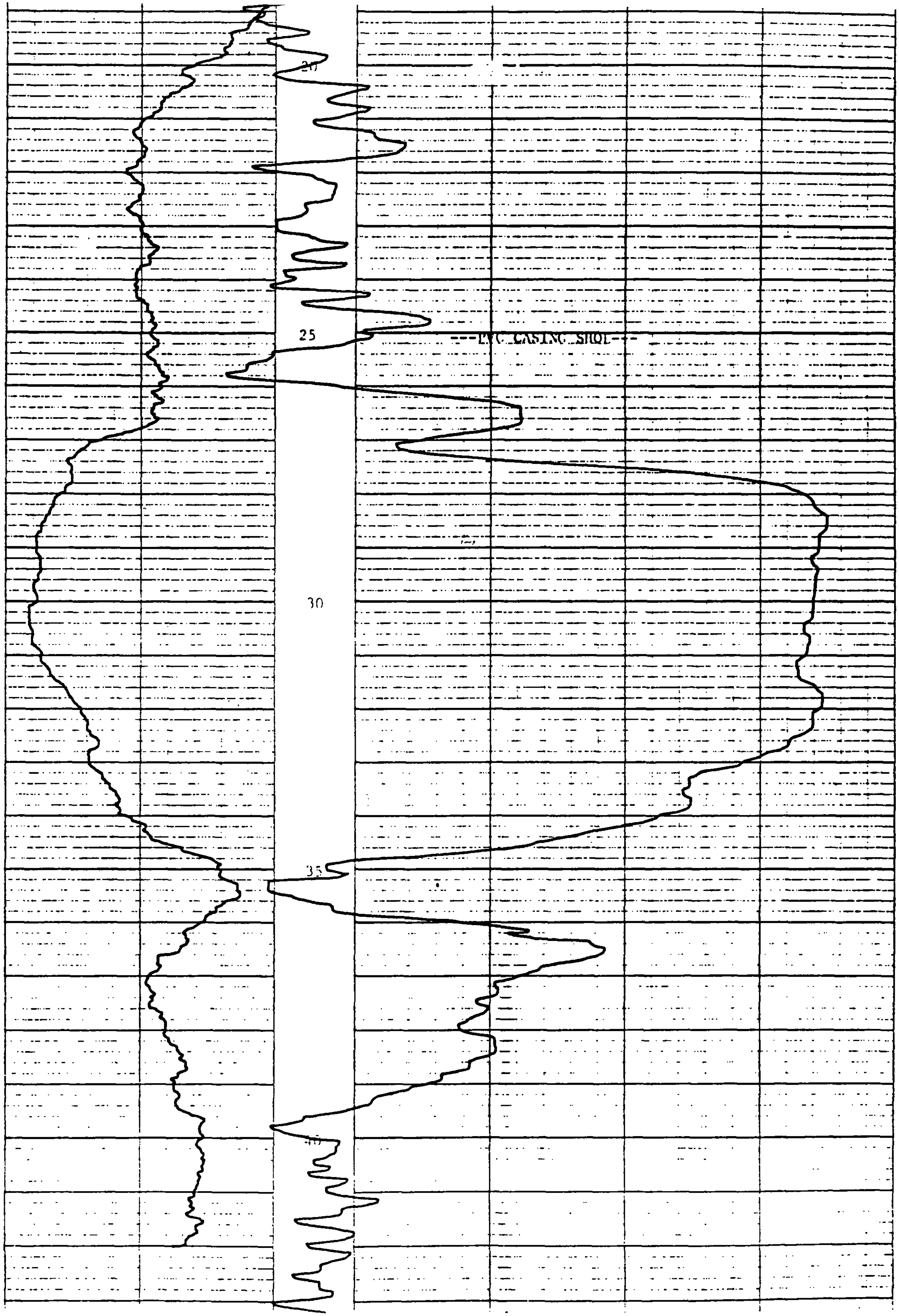
EQUIPMENT AND RECORDING DATA

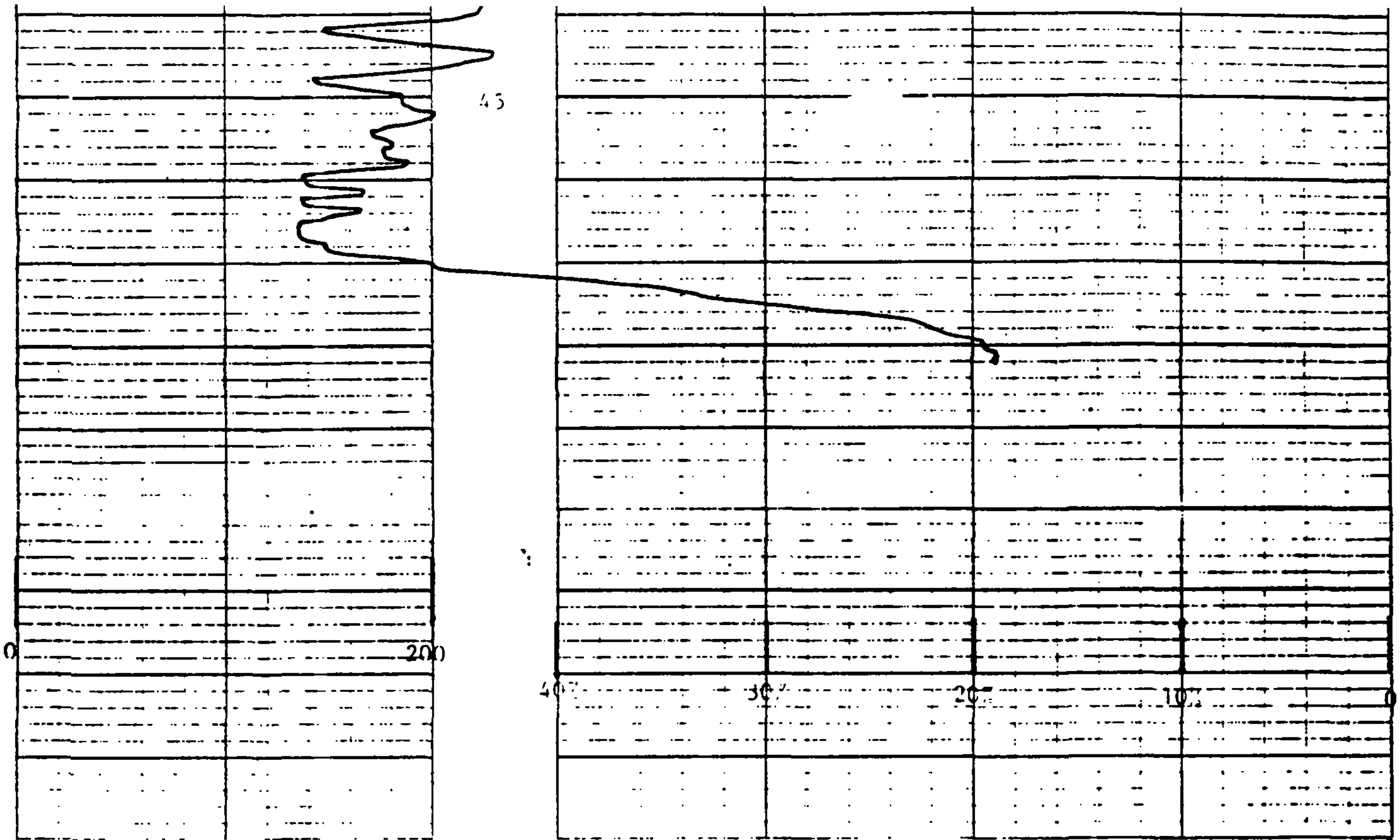
LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T.C. SECS	NORM	
GAMMA	YES	10	D	10	3	10.60	1.5
NEUTRON	YES	10	D	10	1	--	--
		SONDE NO	DSN	SOURCE NO	6220		

REMARKS



GAMMA RAY
NEUTRON POROSITY
API
200
LIMESTONE MATRIX
0
0
200
40%
30%
20%
10%
0
00
5
10
15


20
25
---PVC CASING SHOE---
30
35
40



0 API 200	1":2'	40% LIMESTONE MATRIX 0
GAMMA RAY	DEPTH	NEUTRON POROSITY

BOREHOLE T5-1

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

MY A58452R

GAMMA RAY
LINEAR DENSITY
CALIPER

BOREHOLE TB-1

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

DATE LOGGED 13 JUNE 87

DEPTH SCALE

1 OF 3 LOGS

BOREHOLE DATA

PERMANENT DATUM	GROUND LEVEL				
ELEVATION OF P D	N/A				
	B P B		DRILLER		
MEASUREMENTS FROM	GROUND LEVEL		GROUND LEVEL		
DEPTH REACHED	50'		50'		
CASING SHOE	27'		27'		
BIT SIZES	1	4½" TO 50'	2	TO	
	3	TO	4	TO	
CASING SIZES	1	2" TO 27'	2	TO	

FLUID DATA

NATURE	WATER
S G	1.00 gr/cc
LEVEL	
VISCOSITY	
Rm at meas. temp	
B H T.	

OPERATION DATA

FIRST READING	44'
LAST READING	0'
INTERVAL LOGGED	44'
UNIT-TRUCK No	33-V824
ENGINEER	DONAHUE
WITNESS	TOM FURHOP

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	TC SECS	NORM		FROM	TO	INTERVAL
GAMMA	102B	---	413	YES	10	D	10	3	9.12	1.50	44	0	44
DENSITY	102B	B435	333GR	YES	10	D	10	1	7.38	7.38	48	4	44
CALIPER	102B	---	C824	YES	10	D	10	1/3	--	--	47	3	44

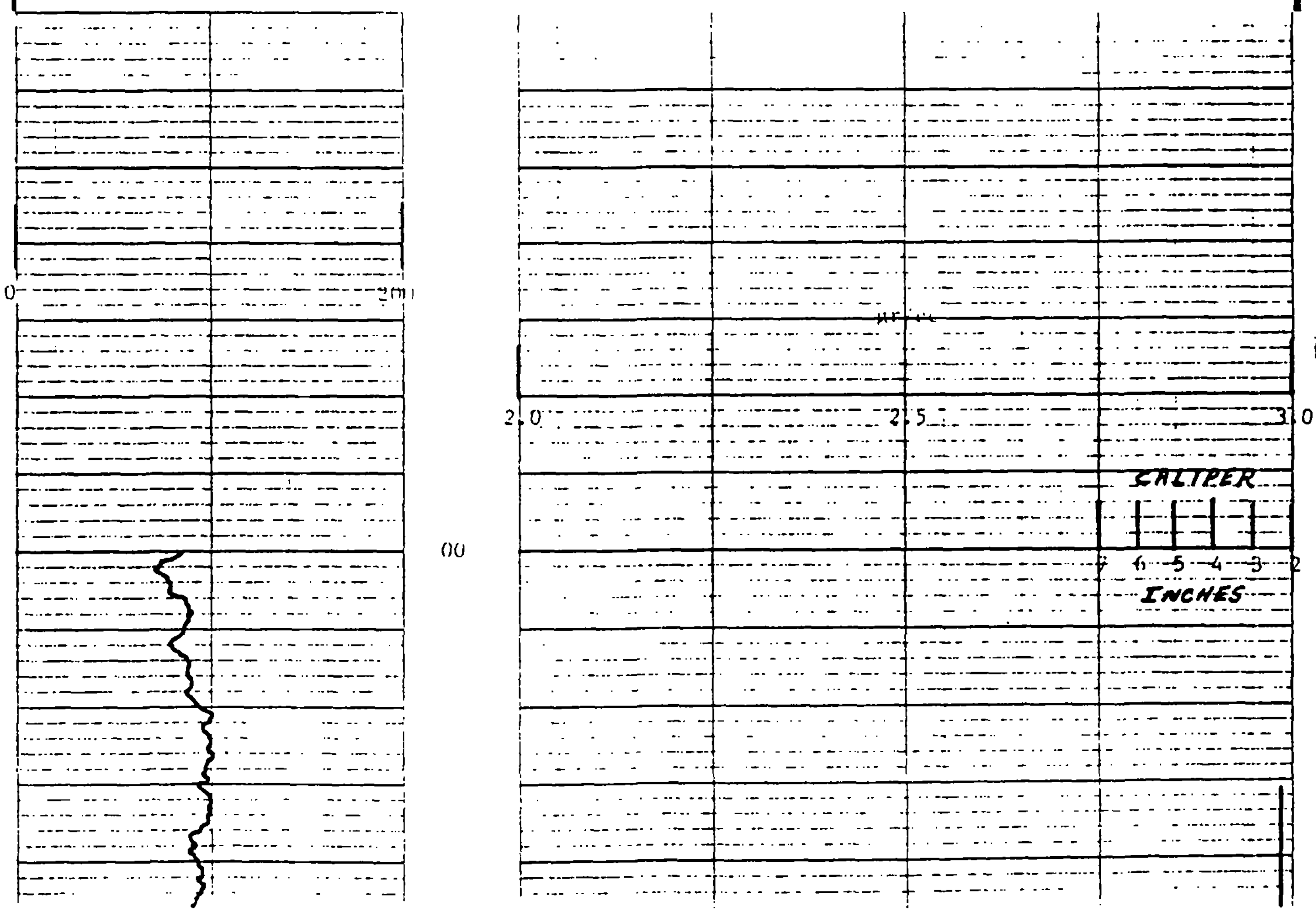
ADDITIONAL SONDES RUN

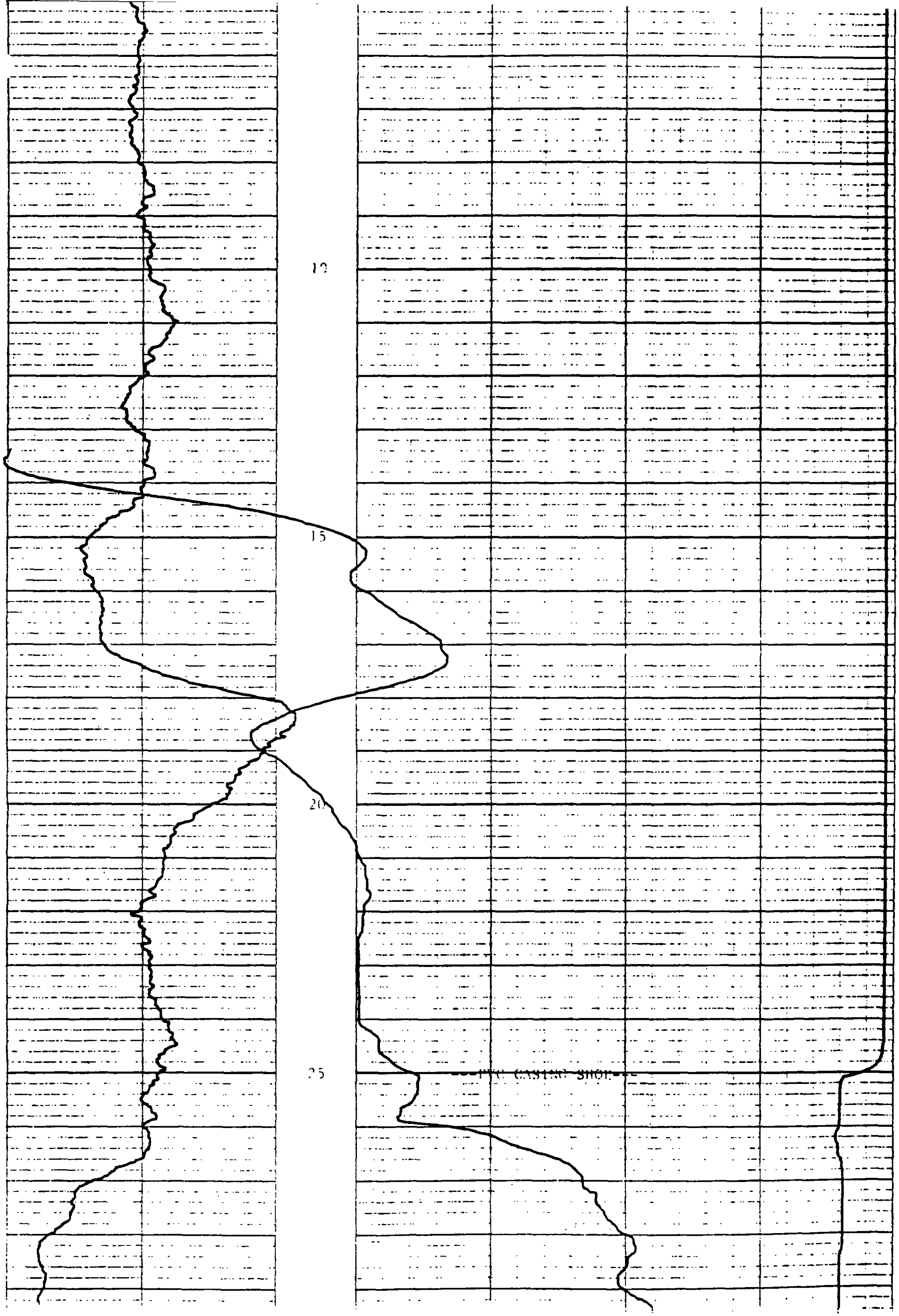
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG
DSN	NEUTRON	NO	YES
DFE	FOCUSSED ELECT		YES

REFER TO ADDITIONAL HEADINGS

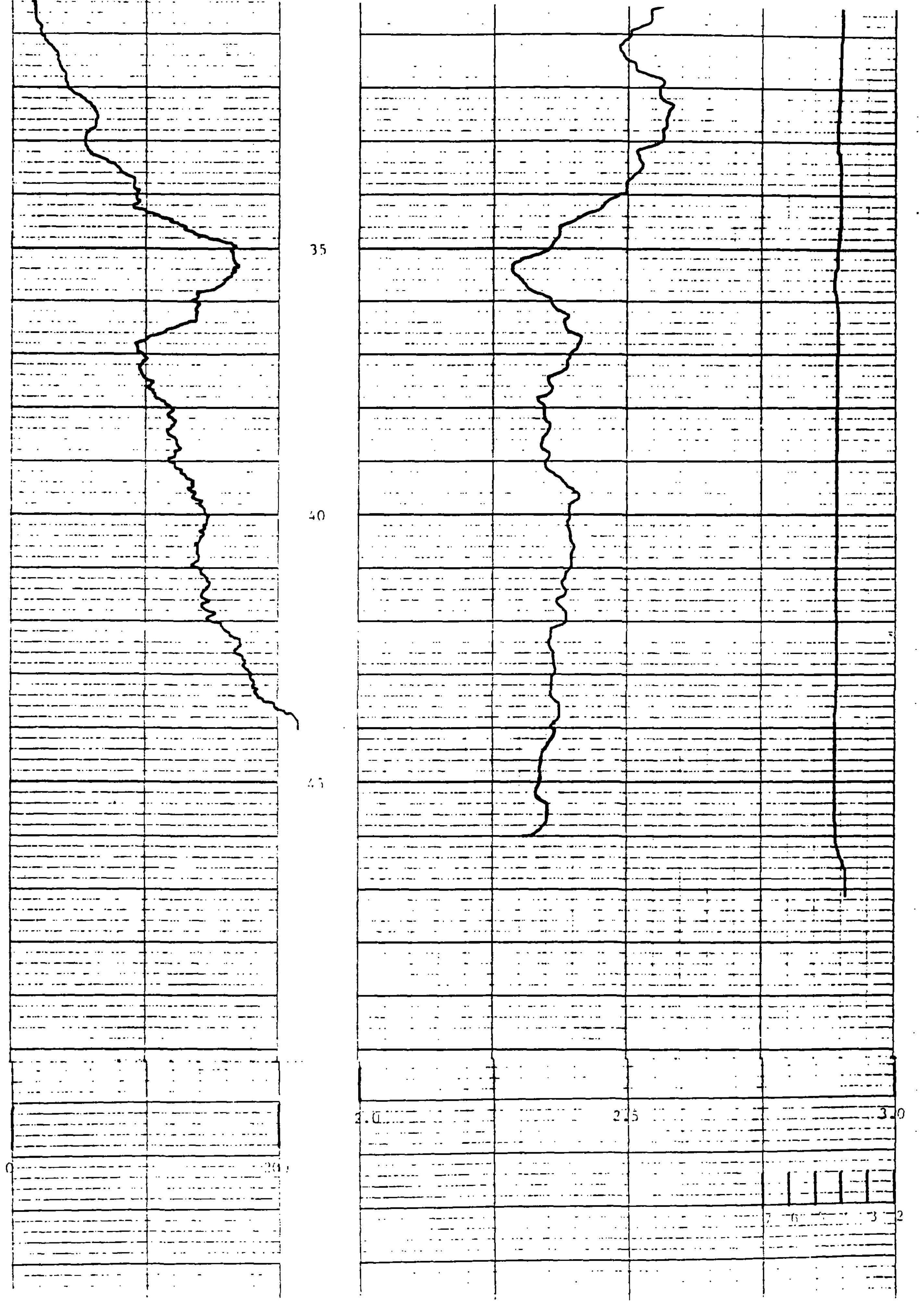
REMARKS

GAMMA RAY	DEPTH	DENSITY	CALIPER
API 200	[illegible]	g/cc 3.0	





15
20
25


35
40
0
20
2.0
2.5
3.0

GAMMA RAY	DEPTH	DENSITY

BOREHOLE TB-1

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

MY 95160 R

BPB

FOCUSSED ELECTRIC LOG

BOREHOLE TB-1

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

DATE LOGGED 13 JUNE 87

DEPTH SCALE 1" : 2'

3 OF 3 LOGS

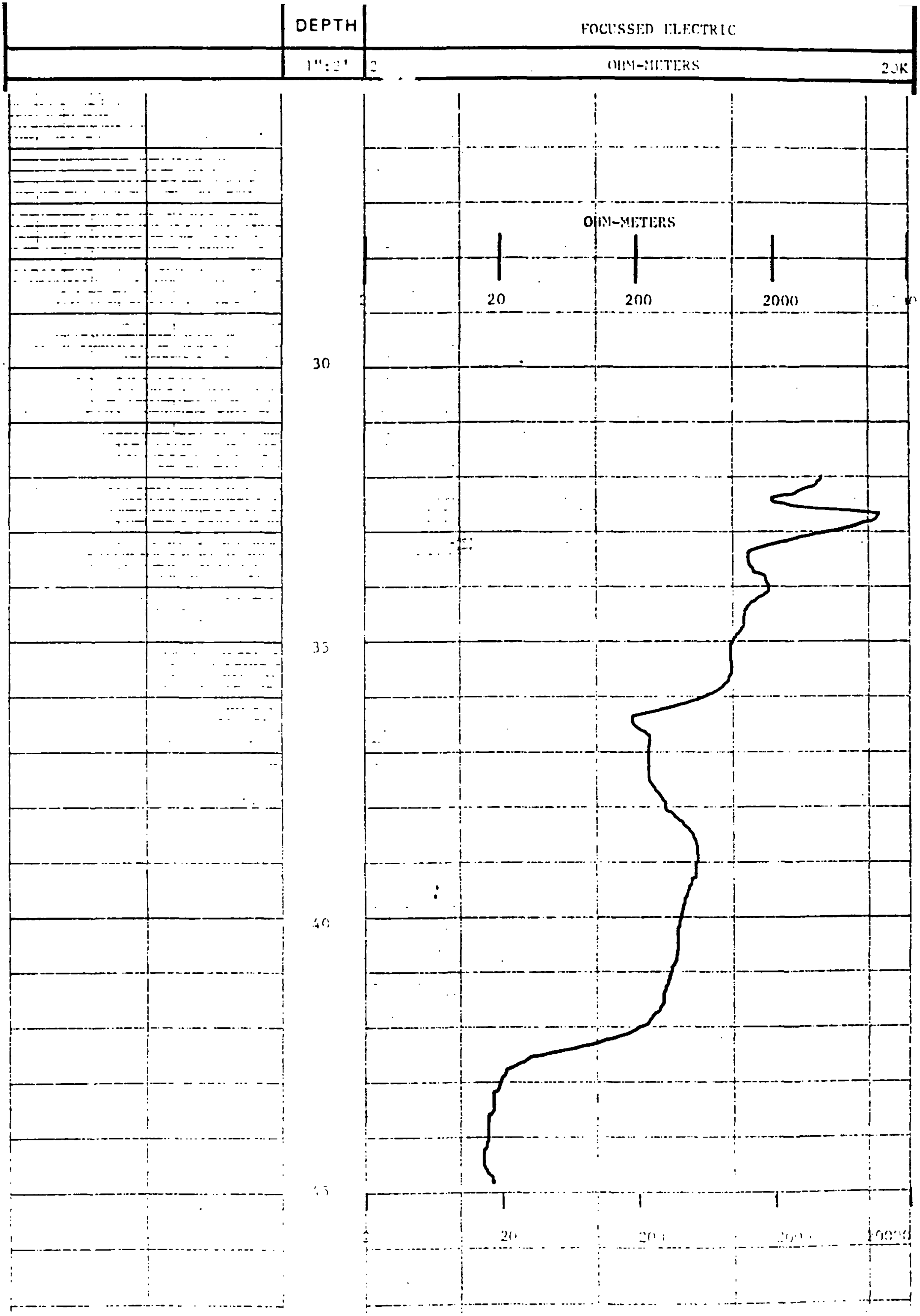
BOREHOLE DATA	REFER TO LITHOLOGY LOG	
OPERATION DATA	REFER TO LITHOLOGY LOG	

EQUIPMENT AND RECORDING DATA

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T.C. SECS	NORM	
F.E.	YES	10	D	10	1/3	--	--

SONDE NO DFE | SOURCE NO ---

REMARKS


DEPTH
FOCUSSED ELECTRIC
1":2'
2
OHM-METERS
20K
OHM-METERS
20
200
2000
30
35
40
45
20
200
2000
20000

	[illegible]	[illegible]
	DEPTH	FOCUSSED ELECTRIC

BPB

BOREHOLE TC-1

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

MY A58452R

CORNISH

WIRELINE SERVICES, INC.

PHONE 431-9308 P.O. DRAWER H CHANUTE, KANSAS

RADIOACTIVITY LOG

FILING NO

COMPANY JOHN MATHES

WELL TB2 - MW102

FIELD

COUNTY JOHNSON STATE MISSOURI

LOCATION

SEC 10 TWP 45N RGE 28W

OTHER SERVICES

PERMANENT DATUM GROUND LEVEL ELEV

LOG MEASURED FROM G. L. FT ABOVE PERM DATUM

DRILLING MEASURED FROM G. L.

ELEV K B

D F

G L

DATE	6-26-87	6-26-87	
RUN NO	1 NW	1 NW	
TYPE LOG	GAMMA RAY	NEUTRON	
DEPTH—DRILLER			
DEPTH—LOGGER	50.2'	50.2'	
BOTTOM LOGGED INTERVAL	44.4'	49.2'	
TOP LOGGED INTERVAL	2.0'	7.0'	
TYPE FLUID IN HOLE	WATER	WATER	
SALINITY, PPM CL			
DENSITY			
LEVEL	FULL	FULL	
MAX. REC TEMP, DEG F.			
OPERATING RIG TIME			
RECORDED BY	UDEN, D.	UDEN, D.	
WITNESSED BY	VEHRHOP, T.	VEHRHOP, T.	

RUN	BORE-HOLE RECORD			CASING RECORD			
NO	BIT	FROM	TO	SIZE	WGT	FROM	TO
				2"		0	50'
				PLASTIC			
				4"		0	12.5'

THIS HEADING AND LOG CONFORMS TO API RP 33

GAMMA RAY					
RUN NO	1 NW		RUN NO	1 NW	
TOOL MODEL NO	9205		LOG TYPE	NEU/NEU	
DIAMETER	1-11/16"		TOOL MODEL NO	9205	
DETECTOR MODEL NO	95SC		DIAMETER	1-11/16"	
TYPE	SCINT.		DETECTOR MODEL NO	95HE	
LENGTH	1"x4"		TYPE	He-3	
DISTANCE TO N. SOURCE	8.5'		LENGTH	1"x6"	
			SOURCE MODEL NO	AC	
GENERAL			SERIAL NO	MRC415	
HOIST TRUCK NO	104		SPACING	13"	
INSTRUMENT TRUCK NO	104		TYPE	Am/Be	
TOOL SERIAL NO	1C		STRENGTH	6.7x10-6	

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T C SEC	SENS SETTINGS	ZERO DIV L OR R	API G.R. UNITS PER LOG DIV	T C SEC	SENS SETTINGS	ZERO DIV L OR R	API N. UNITS PER LOG DIV
1	49.2'	2.0'	25	2.5	10-.0	2L	20	2.0	0-.35	4L	

REFERENCE LITERATURE

REMARKS

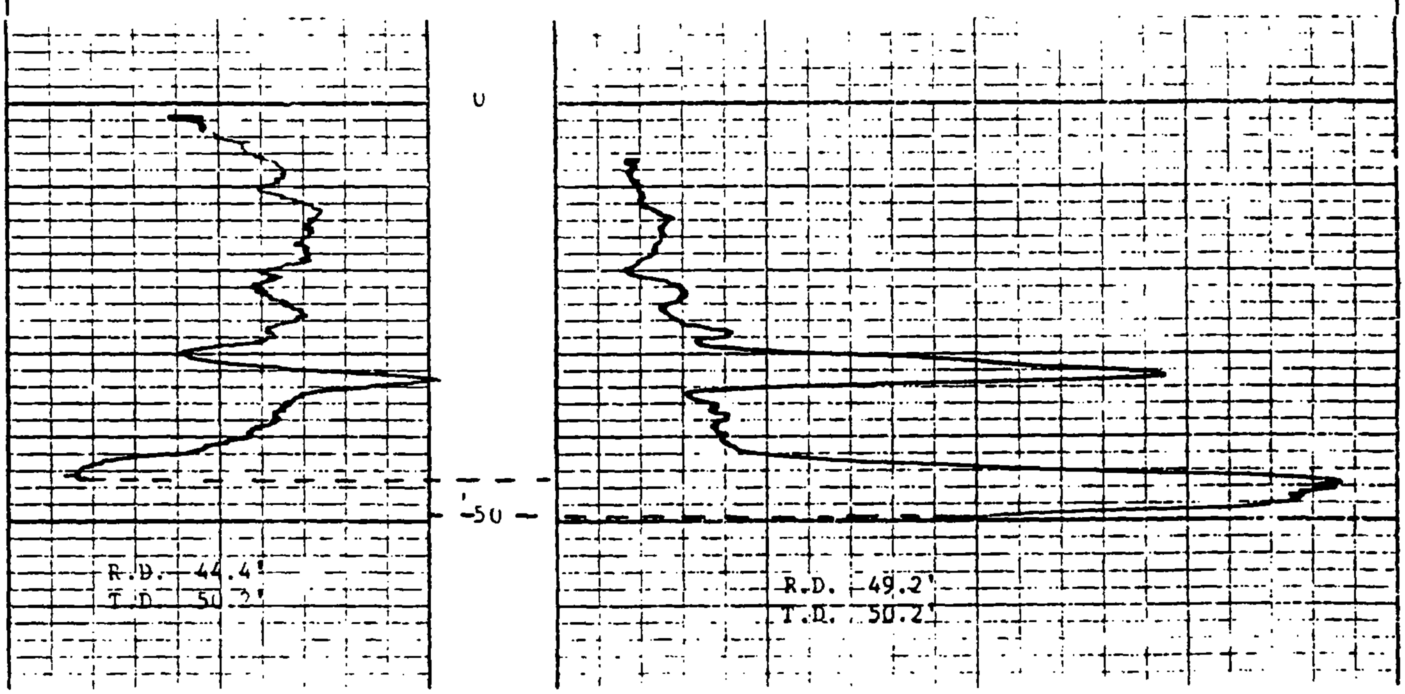
GAMMA RAY

API UNITS

DEPTH AND CASING

NEUTRON

API UNITS



TB2 - MW102

JOHN MATHES

JOHNSON COUNTY, MISSOURI

JUNE 26, 198-

10/45N/28W

FOCUSSED-ELECTRIC LOG

BOREHOLE TB-3

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

DATE LOGGED 12 JUNE 87

DEPTH SCALE 1 : 2

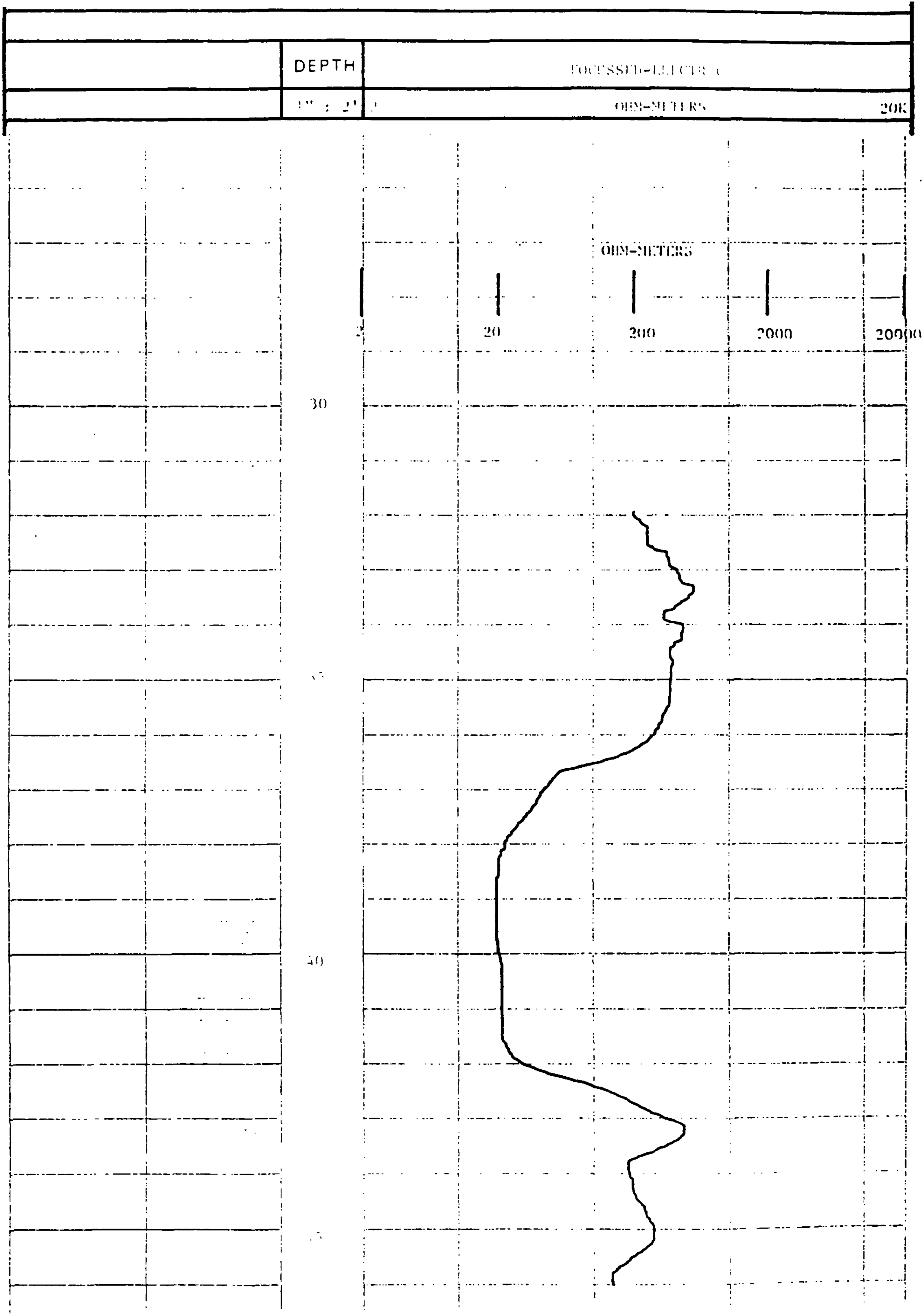
3 OF 3 LOGS

BOREHOLE DATA	REFER TO LITHOLOGY LOG
OPERATION DATA	REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T.C. SECS	NORM	
F.E.	YES	10	D	10	1/3	--	--
		SONDE NO	DFE	SOURCE NO	--		

REMARKS



DEPTH
FOCUSSED-ELECTRIC
1" : 2'
2
OHM-METERS
20K
OHM-METERS
2
20
200
2000
20000
30
35
40
45

2 20 200 2000 20000

1" : 2'	2 OHM-METERS 20K
DEPTH	FOCUSSED ELECTRIC

BOREHOLE TB-3

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

MY A58452 R

BPB

GAMMA RAY
LINEAR DENSITY
CALIPER

BOREHOLE TB-3

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., [illegible]

COUNTRY USA

DATE LOGGED 13 JUNE 87

DEPTH SCALE 1" ; 2'

1 OF 3 LOGS

BOREHOLE DATA

PERMANENT DATUM	GROUND LEVEL				
ELEVATION OF P D	N/A				
	B P B		DRILLER		
MEASUREMENTS FROM	GROUND LEVEL		GROUND LEVEL		
DEPTH REACHED	[illegible]'		[illegible]'		
CASING SHOE	[illegible]'		[illegible]'		
BIT SIZES	1	[illegible]" TO [illegible]'	2	TO	
	3	TO	4	TO	
CASING SIZES	1	[illegible]" TO [illegible]'	2	TO	

FLUID DATA

NATURE	WATER
S G	1.00 gr/cc
LEVEL	
VISCOSITY	
Rm at meas temp	
B H T	

OPERATION DATA

FIRST READING	[illegible]'
LAST READING	0'
INTERVAL LOGGED	[illegible]'
UNIT-TRUCK No	[illegible]
ENGINEER	[illegible]
WITNESS	[illegible]

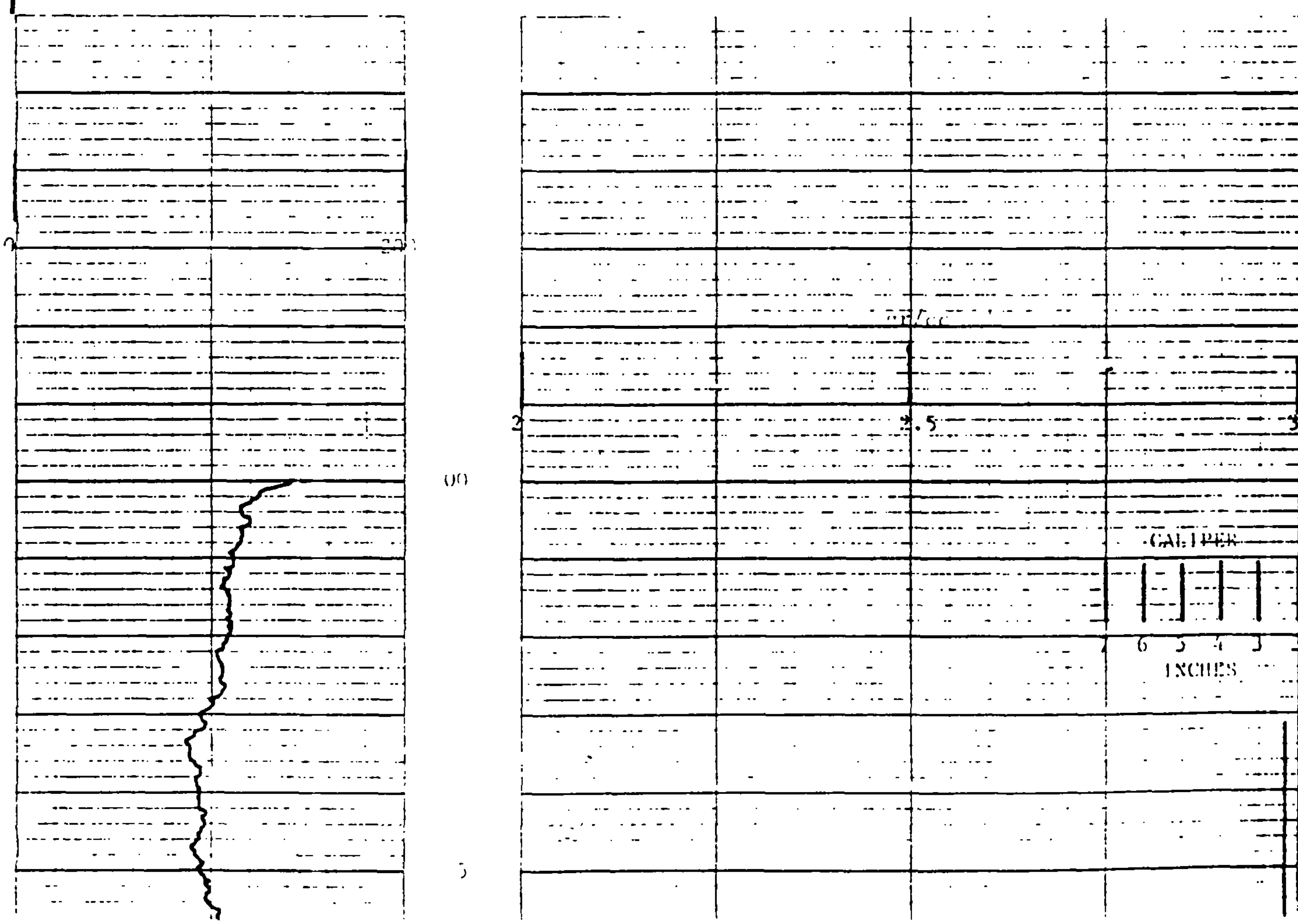
EQUIPMENT AND RECORDING DATA

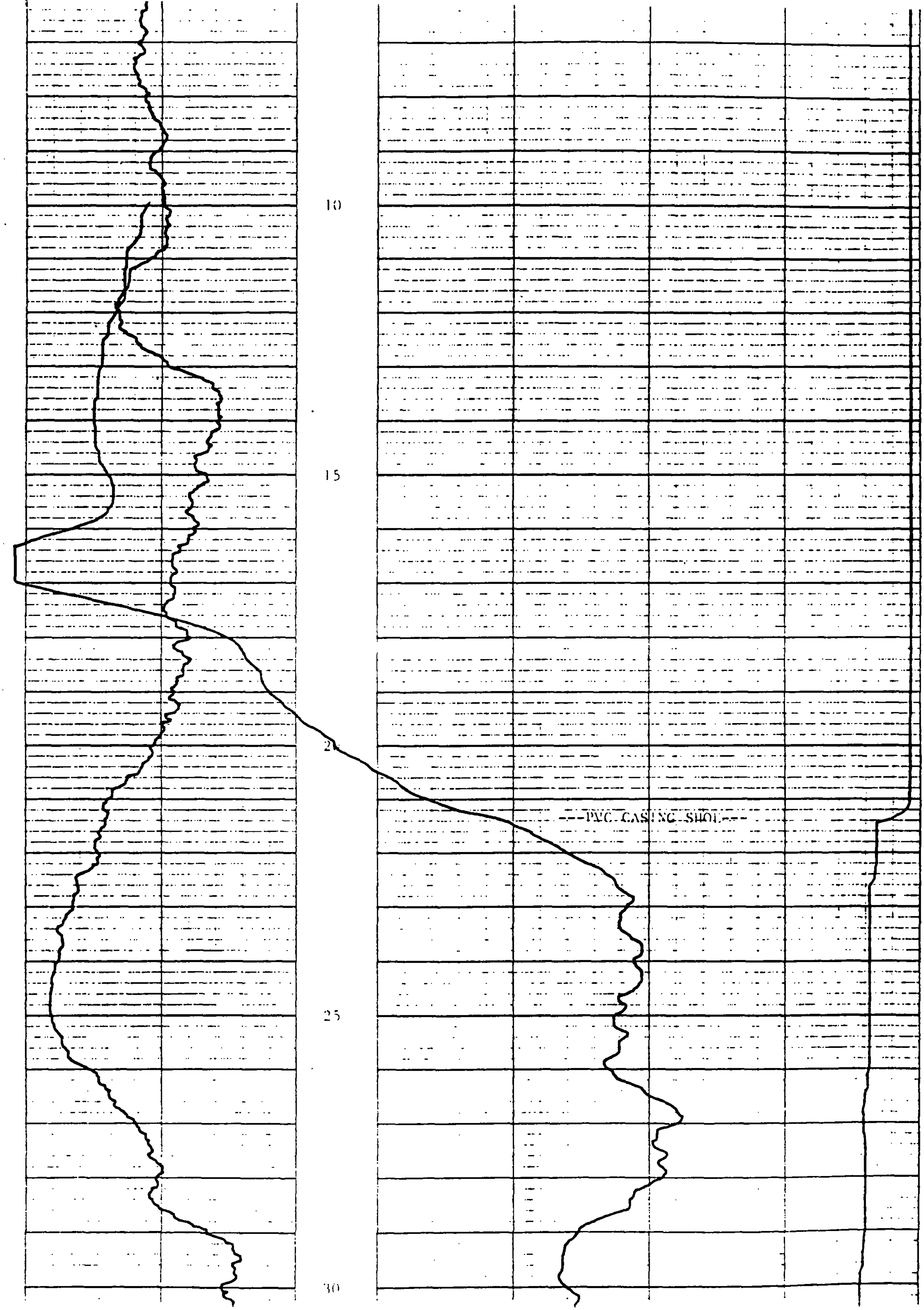
LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS			
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM.		FROM	TO	INTERVAL	
GAMMA	1028	---	413	YES	7	D	7	3	9.12	1.5	46	0	46	
DENSITY	1028	8435	333GR	YES	7	D	7	1	7.38	7.3	50	4	46	
CALIPER	1028	---	C824	YES	7	D	7	1/3	--	--	49	3	46	

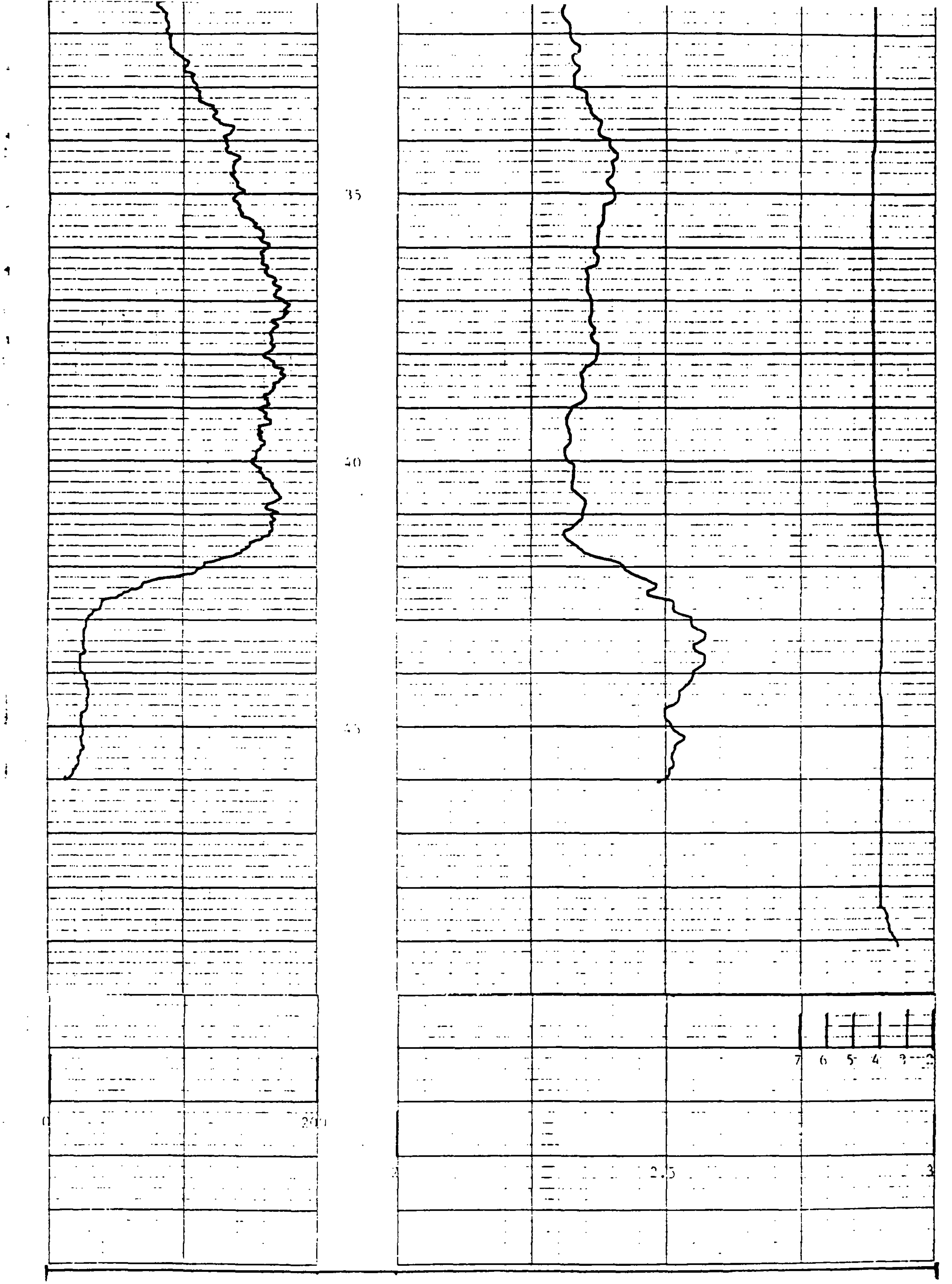
ADDITIONAL SONDES RUN				
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS
DSN	NEUTRON	NO	YES	
DFT	FOCUSSED	ELECT	YES	

REMARKS

GAMMA RAY	DEPTH	DENSITY	CALIPER
		gr/cc	




10
15
20
PVC CASING SHOE
25
30


35
40
0
200
2.5
3
7
6
5
4

CALIPER

BORP

BOREHOLE TB-3

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

MY 93160 R

BPB

GAMMA RAY
DUAL NEUTRON LOG

BOREHOLE TB-3

CLIENT MATHES ENVIRONMENTAL SERVICES

AREA JOHNSON CO., MO.

COUNTRY USA

DATE LOGGED 13-JUNE 87

DEPTH SCALE 1" :2'

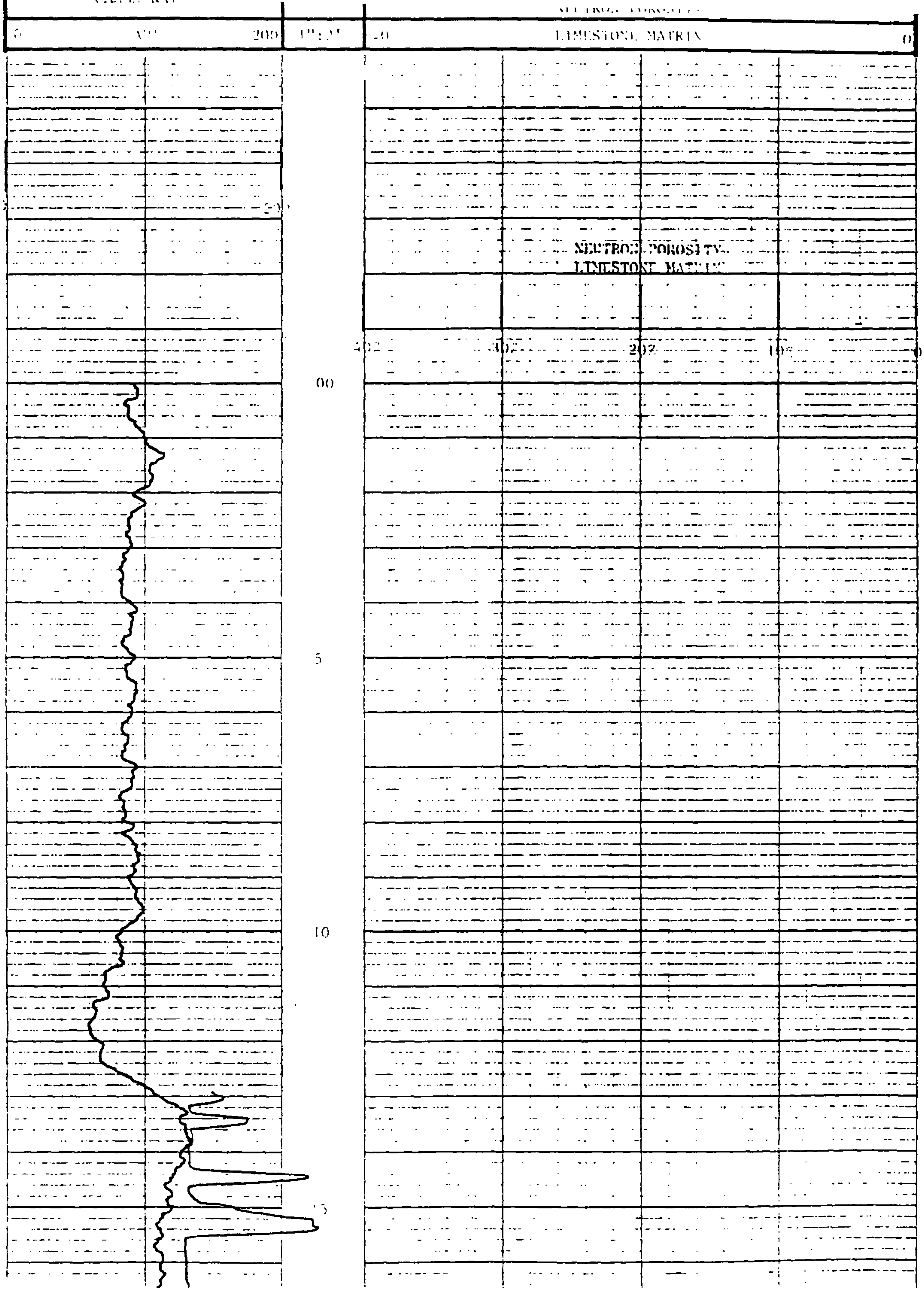
2 OF 3 LOGS

BOREHOLE DATA	REFER TO	LITHOLOGY LOG
OPERATION DATA	REFER TO	LITHOLOGY LOG

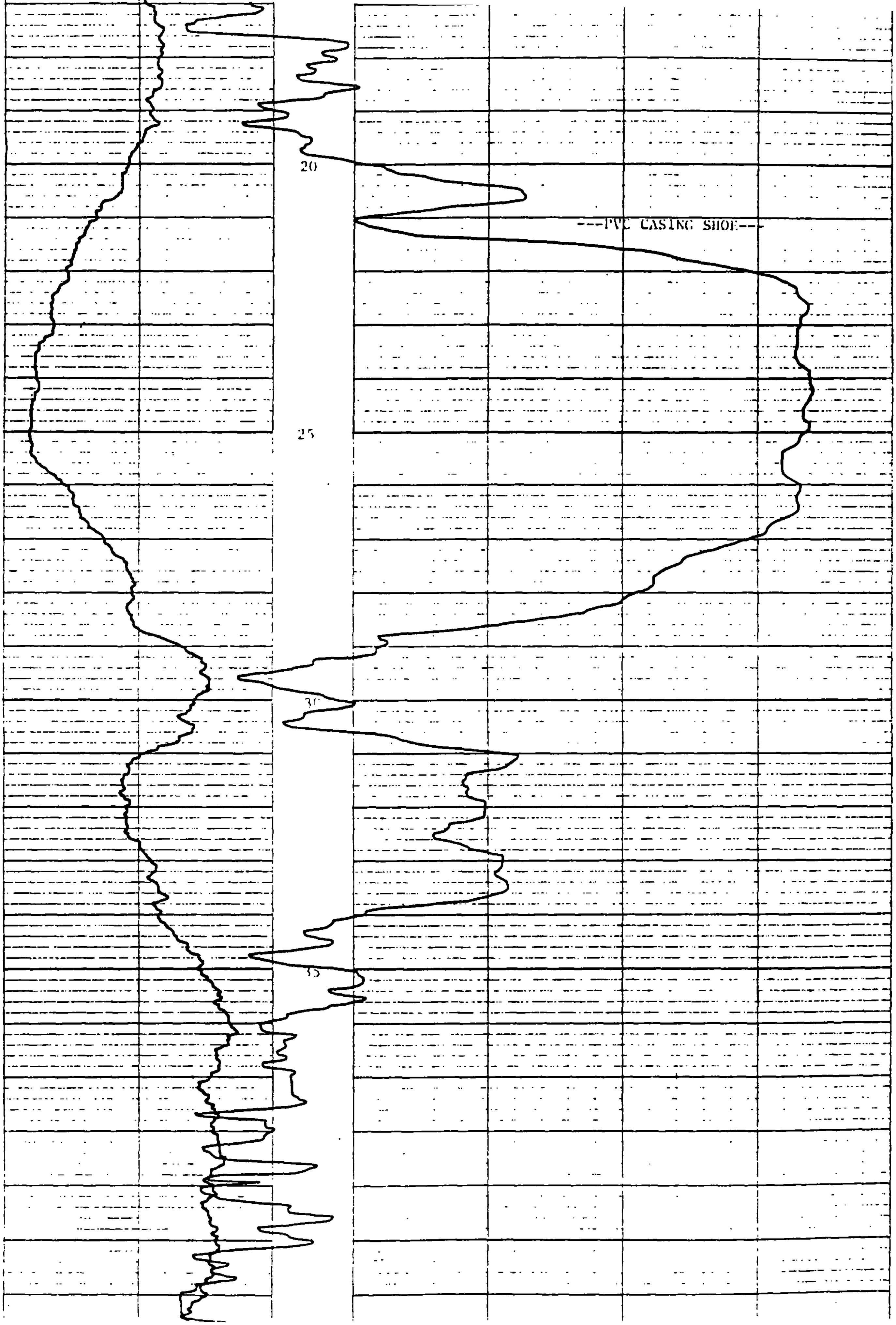
EQUIPMENT AND RECORDING DATA

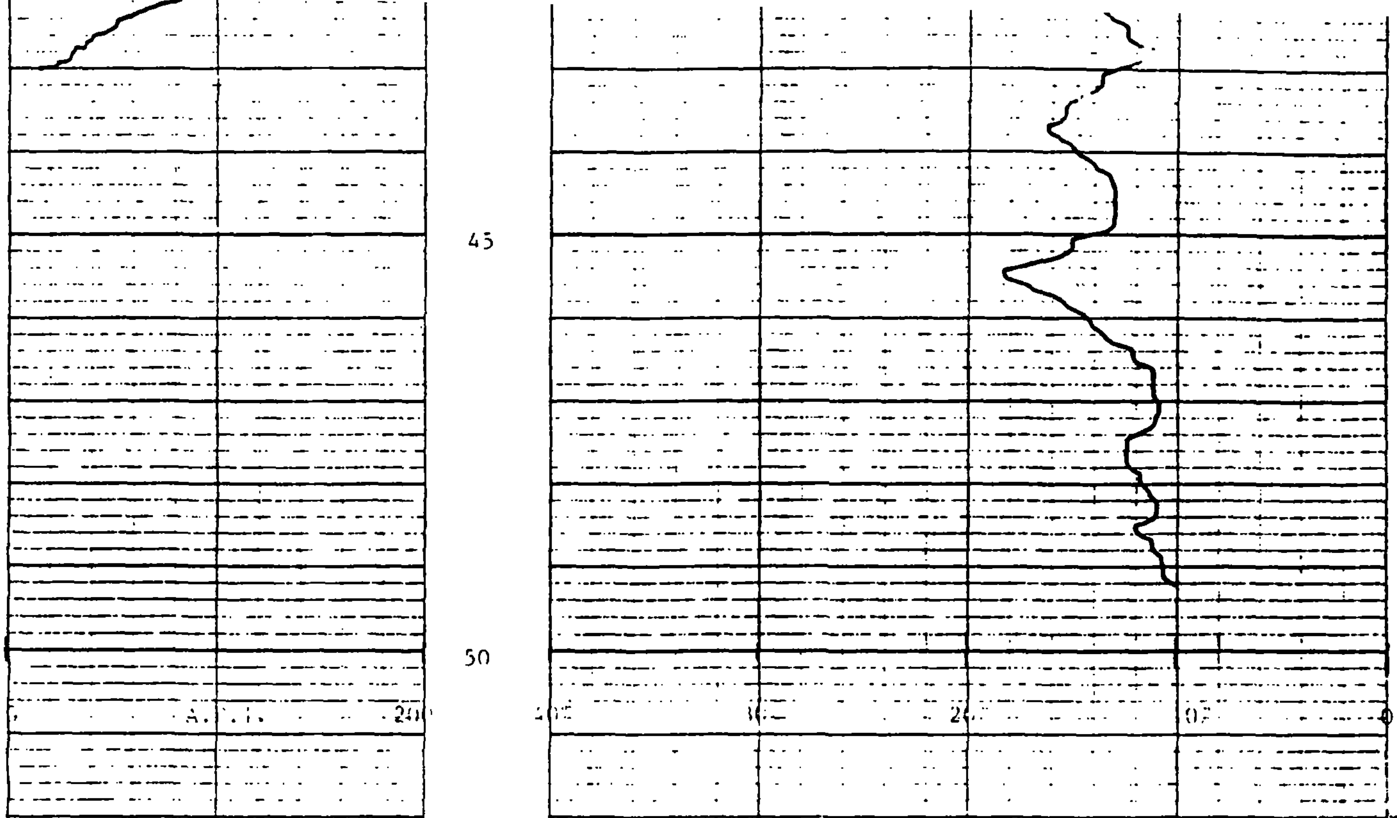
LOG	TAPING			PANEL			CAL COEFF
	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T C SECS	NORM	
GAMMA	YES	10	D	10	3	10.60	1.50
NEUTRON	YES	10	D	10	1	--	--
		SONDE NO	DSN	SOURCE NO	6220		

REMARKS



200
LIMESTONE MATRIX
NEUTRON POROSITY
LIMESTONE MATRIX
40%
30%
20%
10%
0
00
5
10


20
---PVC CASING SHOE---
25
30
35



0 API 200	1":2'	40% LIMESTONE MATRIX
GAMMA RAY	DEPTH	NEUTRON POROSITY

BPB

BOREHOLE Tb-3	AREA JOHNSON CO., MO.
CLIENT MATHES ENVIRONMENTAL SERVICES	COUNTRY USA

MY A58452R

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX E

Soil Sample Physical Tests

ROSE CHEMICAL PROJECT
PHYSICAL TEST RESULTS

Boring Number Sample Number Sample Depth (ft)	TB-1 P-1 8.5-9.0	TB-1 P-1 5.0-5.5	TB-1 P-1 6.5-7.0
Liquid Limit	49	41	57
Plastic Limit	19	21	17
Plastic Index	30	20	40
Permeability (cm/sec)	6.2×10^{-8}	3.0×10^{-8}	4.4×10^{-9}

PERMEABILITY TEST

FALLING HEAD

Project No. 12872844 Technician J. Jacobi Date 7/1/87

SAMPLE DATA Cylinder #2 MC=23.7%

Boring No. TB-1 Sample No. P-1 Jar No. - Depth 8.5-9.0'

TARE NO.			DIAMETER cm	D	3.32
TARE + DRY SOIL			AREA cm^2	A	8.67
TARE			INITIAL HEIGHT cm	L	6.43
DRY SOIL	W_s		INITIAL VOLUME cm^3	V	55.75
SPECIFIC GRAVITY	G_s		INITIAL VOID RATIO	e	
VOLUME OF SOILDS	V_s		VISCOSITY CORRECTION	R_t	

TEST DATA

INITIAL HEAD cm h_o (221.93) AREA OF STANDPIPE cm^2 a 0.53

Date	Day	Time	Elapsed Time min t sec	Flow cm^3 Q	Head Loss cm	Head cm h_1	Coefficient of Permeability k cms/ sec
7/2	ST	1035	-----	--	0	(221.93)	
7/2	1	1730	415	1.17	0.62	220.76	$8.3x10^{-8}$ CM/SEC
7/2	RE	1730	-----	--	0	(220.76)	
7/3	2	2115	1665	5.09	2.08	216.84	$7.1x10^{-8}$ CM/SEC
7/3	RE	2115	-----	--	0	(221.93)	
7/6	3	1048	3693	8.02	4.25	213.91	$6.5x10^{-8}$ CM/SEC
7/6	RE	1048	-----	--	0	(213.91)	
7/7	4	1009	1401	10.83	1.49	211.10	$6.2x10^{-8}$ CM/SEC

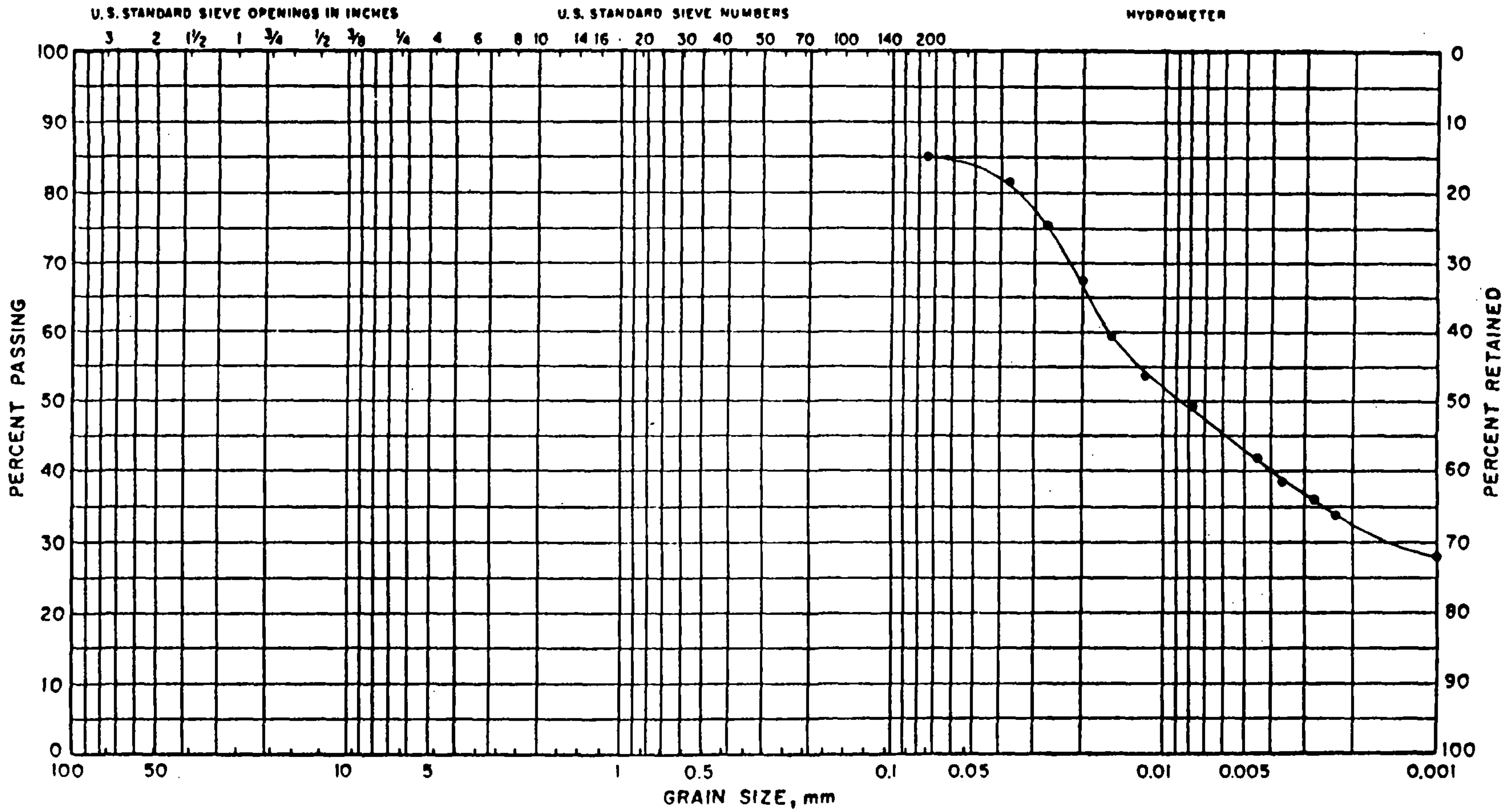
$$k = 2.303 \frac{aL}{At} \text{ LOG } \frac{h_o}{h_1}$$

Computed by J. Jacobi

Checked by D. Ward

MATHES GEOTECHNICAL SERVICES, INC.

PARTICLE SIZE ANALYSIS



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

JOB NO. 12872844 PROJECT Rose Chemical

CURVE	BORING	SAMPLE	DEPTH, ft	DESCRIPTION
1	TB-1	P-1	8.5-9.0	Brown Silty CLAY w/Sand, CL

HYDROMETER ANALYSIS

Project No. 12872844

Date 7/2/87

Boring No. TB-1

Sample No. P-1

Depth, ft. 8.5-9.0'

Material Si Cl w/Sa, CL

G_s 2.7

Diameter, $D = K\sqrt{\frac{L}{T}}$

Dispersing Agent NaPO$_3$

Amount 5 gr.

% Total Sample Finer than #10 100.0% N'

Correction Factor, a, for G_s

% Finer, $N = \frac{Ra}{W_s} \times 100$

% Finer Total Sample $= N \times \frac{N'}{100}$

Elapsed Time, T Minutes	Hydrometer Reading R'	Temp. Deg. C	K	L	D mm	Comp. Corr.	Corrected Reading R	% Finer N	%Finer Total Sample
0.5									
1	46.75	24.5	0.012745	8.666	0.038	-5.23	41.52	81.7	81.7
2	43.5	24.5	0.012745	9.197	0.027	-5.23	38.27	75.3	75.3
4	39.5	24.5	0.012745	9.849	0.020	-5.23	34.27	67.5	67.5
8	35.25	24.6	0.01273	10.544	0.015	-5.20	30.05	59.2	59.2
15	32.25	24.8	0.0127	11.034	0.019	-5.13	27.12	53.4	53.4
30	30.0	25.1	0.012656	11.401	0.008	-5.03	24.97	49.2	49.2
99	26.25	25.7	0.012572	12.013	0.004	-4.82	21.43	42.2	42.2
150	24.0	26.4	0.012474	12.381	0.004	-4.58	19.42	38.2	38.2
261	22.75	26.9	0.012404	12.585	0.003	-4.41	18.34	36.1	36.1
390	21.0	27.6	0.012306	12.871	0.002	-4.16	16.84	33.1	33.1
2037	19.0	25.5	0.0126	13.197	0.001	-4.89	14.11	27.8	27.8

Graduate No. 1

Hydrometer No. 152H 15-1534

W_s 50.28

Starting Time 11:00

AFTER DRYING		AFTER WASHING	
Tare No.			8
$W_s + W_t$			115.36
W_t			107.83
W_s		+ 200	7.53
Disp. Agent —	- 5.00		
W_s			

% Finer Than #200 85.0 %

% Retained 15.0%

Tested by: J. Jacobi

Computed by: J. Jacobi

Checked by: D. Ward

MATHES GEOTECHNICAL SERVICES, INC.

PERMEABILITY TEST

FALLING HEAD

Project No. 12872844 Technician J. Jacobi Date 7/1/87

SAMPLE DATA Cylinder #3 MC=18.5%

Boring No. TB-2 Sample No. P-1 Jar No. - Depth 5.0-5.5'

TARE NO.			DIAMETER cm	D	3.32
TARE + DRY SOIL			AREA cm^2	A	8.68
TARE			INITIAL HEIGHT cm	L	5.738
DRY SOIL	W_s		INITIAL VOLUME cm^3	V	49.81
SPECIFIC GRAVITY	G_s		INITIAL VOID RATIO	e	
VOLUME OF SOILDS	V_s		VISCOSITY CORRECTION	R_t	

TEST DATA

INITIAL HEAD cm h_o (217.81) AREA OF STANDPIPE cm^2 a 0.43

Date	Day	Time	Elapsed Time t min sec	Flow cm^3 Q	Head Loss cm	Head cm h_1	Coefficient of Permeability k cms/min - sec
7/2	ST	1727	-----	--	0	(217.81)	
7/3	1	2115	1668	1.60	4.21	213.60	5.5×10^{-8} CM/SEC
7/3	RE	2115	-----	--	0	(217.81)	
7/6	2	1049	3694	2.08	5.47	212.34	3.3×10^{-8} CM/SEC
7/6	RE	1049	-----	--	0	(212.34)	
7/7	3	1010	1401	.72	7.37	210.44	3.0×10^{-8} CM/SEC
			-----	--			

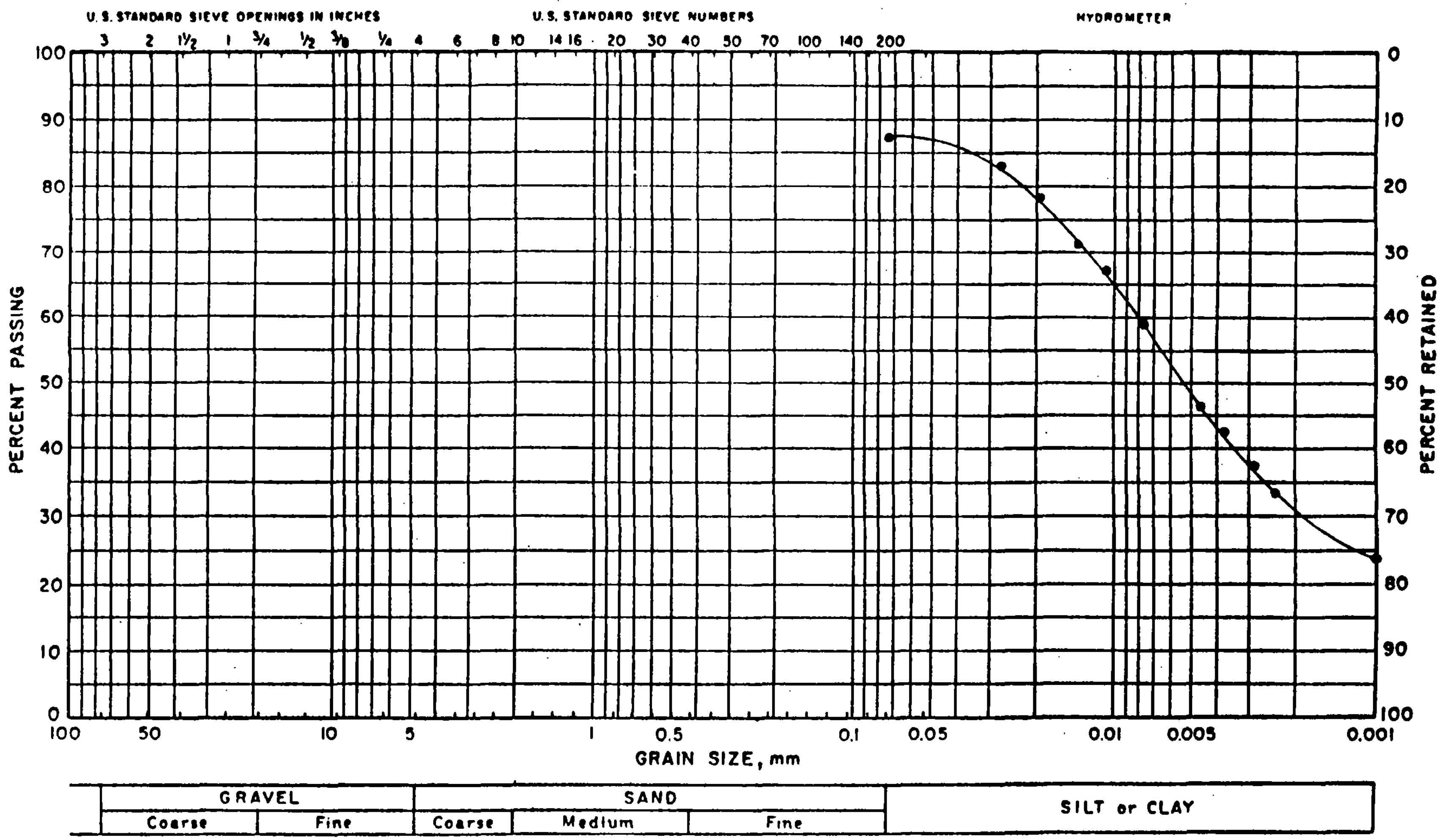
$$k = 2.303 \frac{aL}{At} \text{LOG} \frac{h_o}{h_1}$$

Computed by J. Jacobi

Checked by D. Ward

MATHES GEOTECHNICAL SERVICES, INC.

PARTICLE SIZE ANALYSIS



JOB NO. 12872844 PROJECT Rose Chemical

CURVE	BORING	SAMPLE	DEPTH, ft	DESCRIPTION
2	TB-2	P-1	5.0-5.5	Olive-Brown Highly Weathered Clayey SHALE

HYDROMETER ANALYSIS

Project No. 12872844

Boring No. TB-2

Sample No. P-1

Depth, ft. 5.0-5.5'

Material Wthd Clayey Shale

G_s 2.7

Diameter, $D = K\sqrt{\frac{L}{T}}$

Date 7/2/87

Dispersing Agent $NaPO_3$

Amount 5 gr.

% Total Sample Finer than #10 100.0% N'

Correction Factor, a, for G_s

% Finer, $N = \frac{Ra}{W_s} \times 100$

% Finer Total Sample $= N \times \frac{N'}{100}$

Elapsed Time, T Minutes	Hydrometer Reading R'	Temp. Deg. C	K	L	D mm	Comp. Corr.	Corrected Reading R	% Finer N	%Finer Total Sample
0.5									
1	50.0	24.6	0.01273	8.135	0.036	-5.198	44.80	88.8	88.8
2	47.25	24.6	0.01273	8.584	0.026	-5.198	42.05	83.3	93.3
4	44.75	24.6	0.01273	8.992	0.019	-5.198	39.55	78.4	78.4
8	41.01	24.7	0.012715	9.605	0.014	-5.163	35.84	71.0	71.0
15	39.0	24.9	0.012685	9.931	0.010	-5.094	33.91	67.2	67.2
30	34.75	25.1	0.012656	10.625	0.008	-5.026	29.72	58.9	58.9
90	28.5	25.6	0.012586	11.646	0.005	-4.853	23.65	46.9	46.9
141	26.0	26.3	0.012488	12.054	0.004	-4.612	21.39	42.4	42.4
252	23.25	26.8	0.012418	12.503	0.003	-4.440	18.81	37.3	37.3
380	21.25	27.5	0.01232	12.830	0.002	-4.199	17.05	33.8	33.8
2028	17.0	25.4	0.012614	13.524	0.001	-4.922	12.08	23.9	23.9

Graduate No. 2

Hydrometer No. 15-1534

W_s 49.95

Starting Time 11:00

AFTER DRYING		AFTER WASHING	
Tare No.			10
$W_s + W_t$			116.15
W_t			109.76
W_s		+ 200	6.39
Disp. Agent —	- 5.00		
W_s			

% Finer Than #200 87.2 %

% Retained 12.8 %

Tested by: J. Jacobi

Computed by: J. Jacobi

Checked by: D. Ward

MATHES GEOTECHNICAL SERVICES, INC.

PERMEABILITY TEST

FALLING HEAD

Project No. 12872844 Technician J. Jacobi Date 7/1/87

SAMPLE DATA Cylinder #21 MC=18.8%					
Boring No. TB-3 Sample No. P-1			Jar No. - Depth 3.5-4.0'		
TARE NO.			DIAMETER cm	D	3.32
TARE + DRY SOIL			AREA cm^2	A	8.68
TARE			INITIAL HEIGHT cm	L	6.472
DRY SOIL	W_s		INITIAL VOLUME cm^3	V	56.18
SPECIFIC GRAVITY	G_s		INITIAL VOID RATIO	e	
VOLUME OF SOILDS	V_s		VISCOSITY CORRECTION	R_t	

TEST DATA

INITIAL HEAD cm h_o (226.06) AREA OF STANDPIPE cm^2 a 0.43

Date	Day	Time	Elapsed Time min ' sec	Flow cm^3 Q	Head Loss cm	Head cm h_1	Coefficient of Permeability k cms/ - sec
7/2	ST	1035	-----	--		(226.06)	
7/2	1	1730	415	0.13	0.34	225.72	1.9×10^{-8} CM/SEC
7/2	RE	1730	-----	--		(225.72)	
7/3	2	2115	1665	0.18	0.82	225.24	6.8×10^{-9} CM/SEC
7/3	RE	2115	-----	--		(225.24)	
7/6	3	1050	3695	0.26	1.50	224.56	4.4×10^{-9} CM/SEC
7/6	RE	1050	-----	--		(224.56)	
7/7	4	1011	1401	0.10	1.76	224.30	4.4×10^{-9} CM/SEC

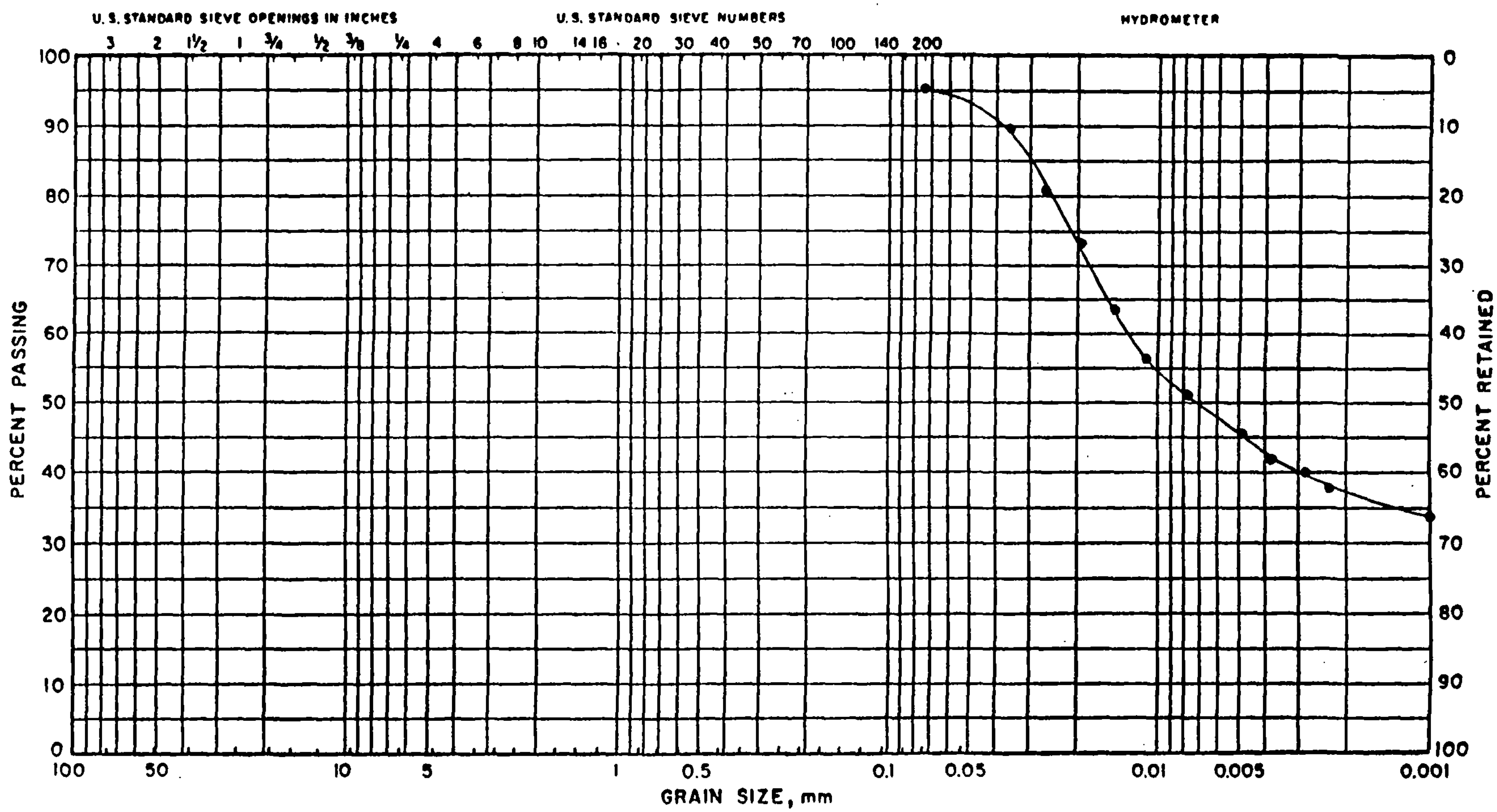
$$k = 2.303\frac{aL}{At}\ \mathrm{LOG}\ \frac{h_o}{h_1}$$

Computed by J. Jacobi

Checked by D. Ward

MATHES GEOTECHNICAL SERVICES, INC.

PARTICLE SIZE ANALYSIS



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

JOB NO. 12872844 PROJECT Rose Chemical

CURVE	BORING	SAMPLE	DEPTH, ft	DESCRIPTION
3	TB-3	P-1	3.5-4.0	Brown CLAY w/Silt Trace Sand, CH

HYDROMETER ANALYSIS

Project No. 12862844

Date 7/2/87

Boring No. TB-3

Sample No. P-1

Depth, ft. 3.5-4.0'

Material Clay w/Si, Tr Sa, CH

G_s 2.7

Diameter, $D = K\sqrt{\frac{L}{T}}$

Dispersing Agent $NaPO_3$

Amount 5 gr.

% Total Sample Finer than #10 100.0% N'

Correction Factor, a, for G_s

% Finer, $N = \frac{Ra}{W_s} \times 100$

% Finer Total Sample $= N \times \frac{N'}{100}$

Elapsed Time, T Minutes	Hydrometer Reading R'	Temp. Deg. C	K	L	D mm	Comp. Corr.	Corrected Reading R	% Finer N	%Finer Total Sample
0.5									
1	52.75	25	0.0127	7.686	0.035	-5.06	47.69	89.6	89.6
2	48.25	25	0.0127	8.421	0.026	-5.06	43.19	81.2	81.2
4	44.25	25	0.0127	9.074	0.091	-5.06	39.19	73.6	73.6
8	39.0	25	0.0127	9.931	0.014	-5.06	33.94	63.8	63.8
15	35.0	25.1	0.0127	10.585	0.011	-5.03	29.97	56.3	56.3
30	32.25	25.3	0.0126	11.037	0.008	-4.96	27.29	51.3	51.3
60	29.25	25.6	0.0126	11.524	0.005	-4.85	24.40	45.8	45.8
120	27.0	26.3	0.0125	11.891	0.004	-4.61	22.39	42.1	42.1
240	25.75	26.8	0.0124	12.095	0.003	-4.44	21.31	40.0	40.0
480	24.25	27.6	0.0123	12.340	0.002	-4.16	20.08	37.7	37.7
1440	23.0	25.3	0.0126	12.544	0.001	-4.96	18.04	33.9	33.9

Graduate No. 3

Hydrometer No. 15-1534

W_s 52.68

Starting Time 11:20

AFTER DRYING		AFTER WASHING	
Tare No.			20
$W_s + W_t$			98.77
W_t			96.44
W_s		+ 200	2.33
Disp. Agent —	- 5.00		
W_s			

% Finer Than #200 95.6 %

% Retained 4.4 %

Tested by: J. Jacobi

Computed by: J. Jacobi

Checked by: D. Ward

MATHES GEOTECHNICAL SERVICES, INC.

MOISTURE CONTENT DETERMINATION

Checked: Ward

Date 7/2/87 Test By J. Jacobi Job Number 12872844

Boring/Sample	TB-1	TB-2	TB-3				
Container Number	126	153	240				
Wt. wet Soil + Tare	32.47	45.72	46.78				
Wt. dry Soil + Tare	28.31	40.34	41.14				
Wt. Water	-	-	-				
Wt. Tare	10.47	11.28	11.17				
Wt. Dry Soil	-	-	-				
Moisture Content%	23.7	18.5	18.8				
PR (Qp)							

Boring/Sample							
Container Number							
Wt. wet Soil + Tare							
Wt. dry Soil + Tare							
Wt. Water							
Wt. Tare							
Wt. Dry Soil							
Moisture Content %							
PR (Qp)							

Boring/Sample							
Container Number							
Wt. wet Soil + Tare							
Wt. dry Soil + Tare							
Wt. Water							
Wt. Tare							
Wt. Dry Soil							
Moisture Content %							
PR (Qp)							

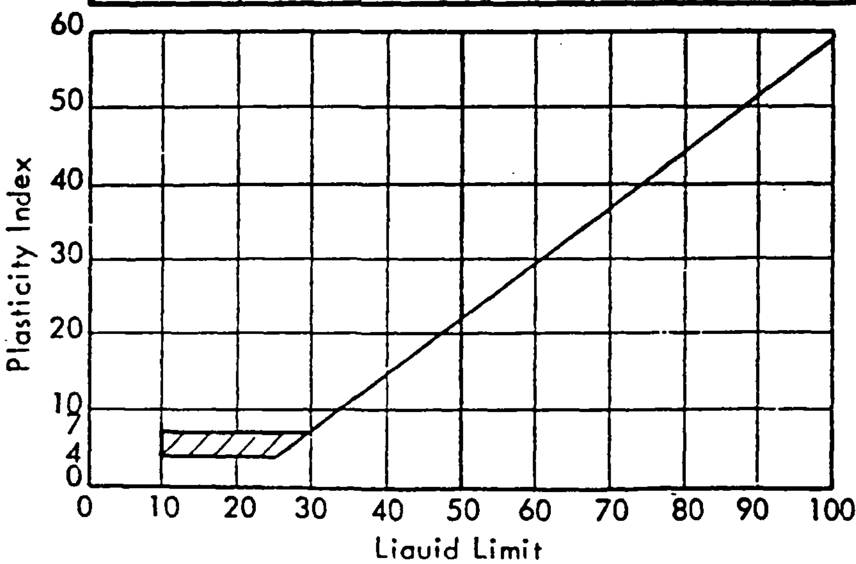
Boring/Sample							
Container Number							
Wt. wet Soil + Tare							
Wt. dry Soil + Tare							
Wt. Water							
Wt. Tare							
Wt. Dry Soil							
Moisture Content %							
PR (Qp)							

Boring/Sample							
Container Number							
Wt. wet Soil + Tare							
Wt. dry Soil + Tare							
Wt. Water							
Wt. Tare							
Wt. Dry Soil							
Moisture Content %							
PR (Qp)							

ATTERBERG LIMIT DETERMINATIONS

Job No.: 12872844 Date: 7/2/87

Boring No.		TB-3		TB-1		TB-2					
Sample No.		P-1		P-1		P-1					
Depth, ft		3.5 - 4.0'		8.5 - 9.0'		5.0 - 5.5'					
Description		CH		CL		CL					
Check one	Air-Dried										
	Nat w										
LIQUID LIMIT DET.	Tare No.	9	181	156	41	76	14				
	Wet Wt. + Tare	26.48	31.31	22.21	24.84	26.15	25.84				
	Dry Wt. + Tare	21.08	23.92	18.58	20.44	21.88	21.56				
	Tare Wt.	11.52	11.16	11.19	11.40	11.73	11.18				
	Wt. of Water										
	Wt. of Dry Sample										
	% Moisture (^wN)	56.5	57.9	49.1	48.7	42.1	41.2				
	No. of Blows (N)	29	21	26	28	23	25				
	Liquid Limit (LL)	57.5	56.7	49.4	49.3	41.6	41.2				
	Avg. Liquid Limit (LL)	57		49		41					
PLASTIC LIMIT DET.	Tare No.	112	38	183	412	10	23				
	Wet Wt. + Tare	20.30	21.55	20.47	18.23	20.12	23.09				
	Dry Wt. + Tare	19.08	20.09	18.99	17.14	18.62	21.06				
	Tare Wt.	11.63	11.35	11.22	11.56	11.39	11.53				
	Wt. of Water										
	Wt. of Dry Sample										
	Plastic Limit (PL)	16.4	16.7	19.0	19.5	20.7	21.3				
	Avg. Plastic Limit (LL)	17		19		21					
Plasticity Index (PI)			40		30		20				



$$LL = {}^wN \left({}^N/_{25}\right)^{0.121}$$

where

LL = Liquid Limit

^wN = Moisture Content at N Blows

N = Number of Blows

$$PI = LL - PL$$

Tested By: J. Jacobi

Computed By: J. Jacobi

Checked By: D. Ward

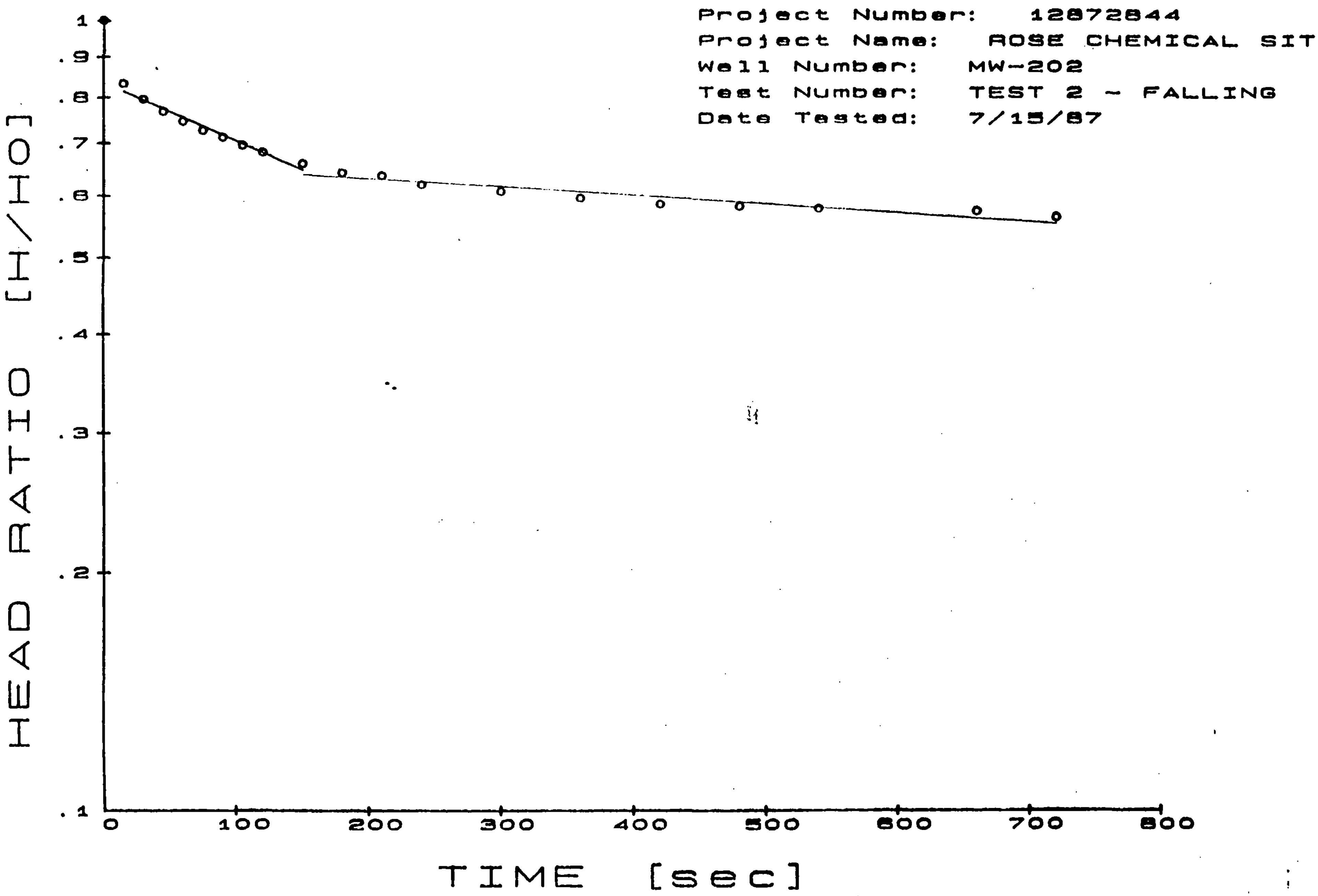
ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX F

Aquifer Slug Tests

HVORSLEV METHOD SLUG TEST

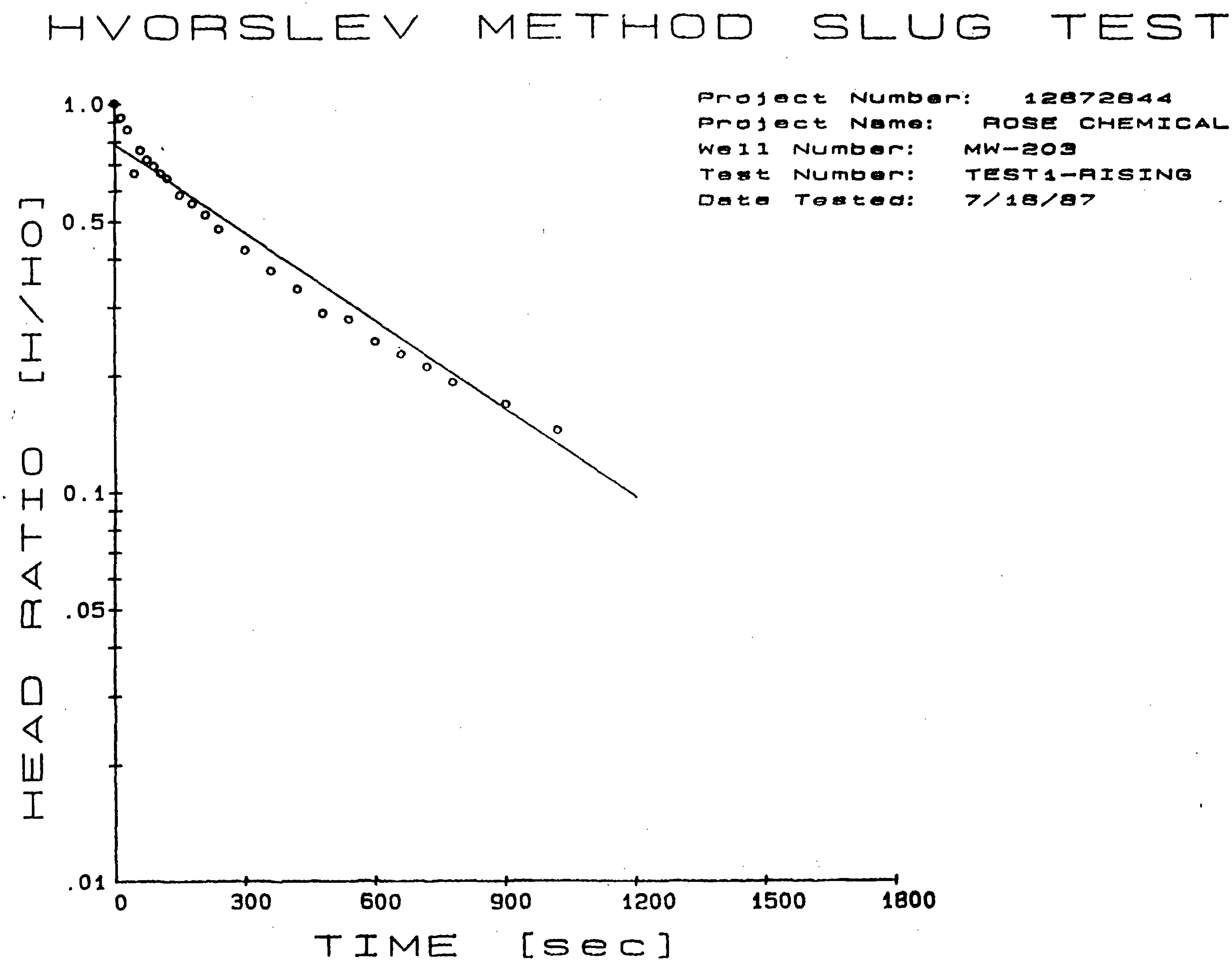


Date Tested: 7/15/87

Project Number: 12872844
Project Name: ROSE CHEMICAL SITE
Well Number: MW-202
Test Number: TEST 2 - FALLING

Static Water Level: 9.939 feet
H0: 6.000 feet

Elapsed Time (sec)	Water Level (ft)	H(feet)	H/H0
0	3.940	6.000	1.000
15	4.940	5.000	0.833
30	5.170	4.770	0.795
45	5.330	4.610	0.768
60	5.460	4.480	0.747
75	5.580	4.360	0.727
90	5.670	4.270	0.712
105	5.770	4.170	0.695
120	5.850	4.090	0.682
150	5.980	3.960	0.660
180	6.080	3.860	0.643
210	6.120	3.820	0.637
240	6.230	3.710	0.618
300	6.310	3.630	0.605
360	6.380	3.560	0.593
420	6.440	3.500	0.583
480	6.460	3.480	0.580
540	6.480	3.460	0.577
660	6.500	3.440	0.573
720	6.560	3.380	0.563



HVORSLEV METHOD SLUG TEST
Project Number: 12872844
Project Name: ROSE CHEMICAL
Well Number: MW-203
Test Number: TEST1-RISING
Date Tested: 7/18/87
1.0
0.5
0.1
.05
.01
0
300
600
900
1200
1500
1800
HEAD RATIO [H/HO]
TIME [sec]

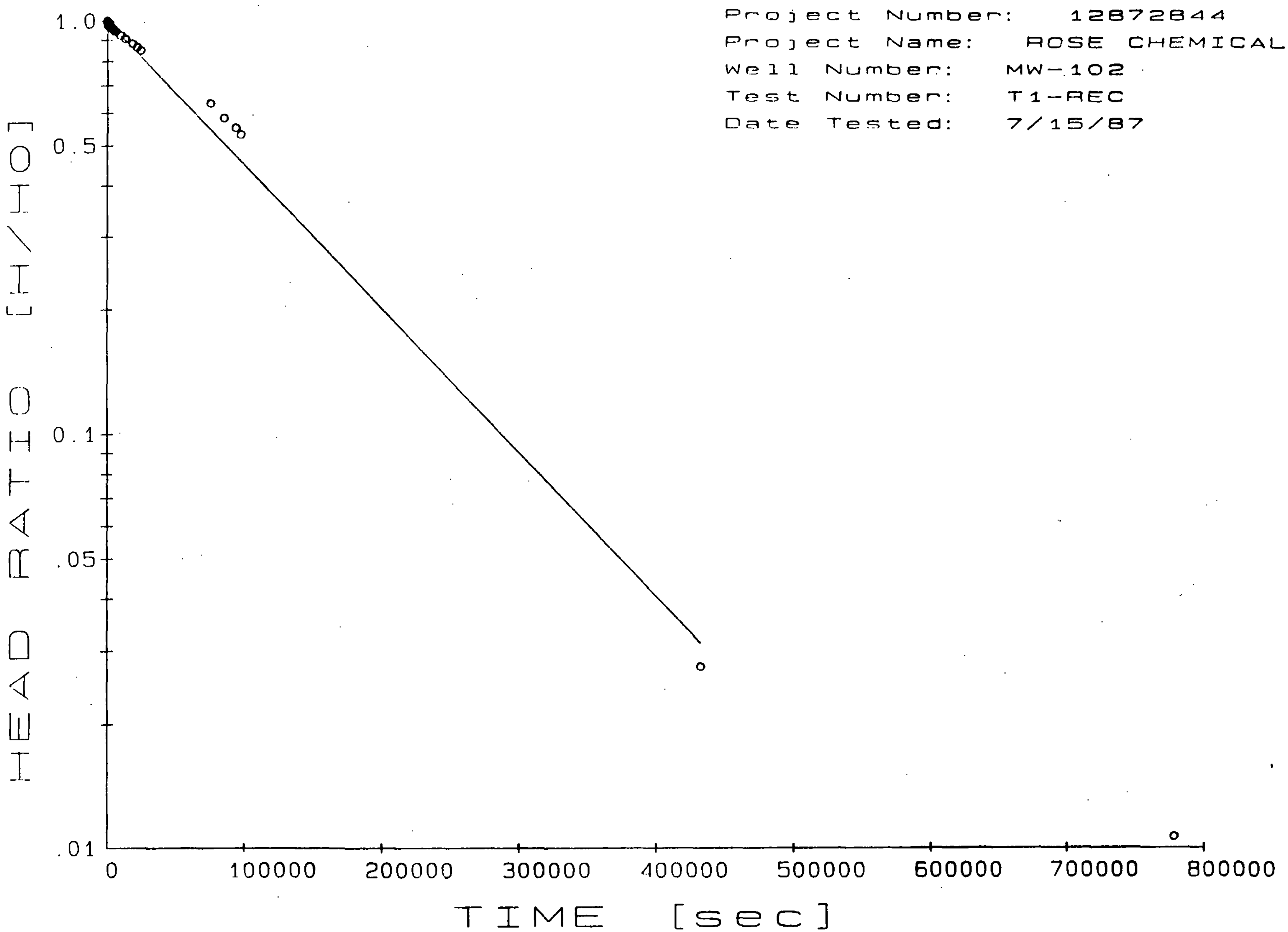
Date Tested: 7/16/87

Project Number: 12872844
Project Name: ROSE CHEMICAL
Well Number: MW-203
Test Number: TEST1-RISING

Static Water Level: 3.77 feet
H0: 2.170 feet

Elapsed Time (sec)	Water Level (ft)	H(feet)	H/HO
0	5.940	2.170	1.000
15	5.770	2.000	0.922
30	5.630	1.860	0.857
45	5.210	1.440	0.664
60	5.420	1.650	0.760
75	5.330	1.560	0.719
90	5.270	1.500	0.691
105	5.210	1.440	0.664
120	5.170	1.400	0.645
150	5.040	1.270	0.585
180	4.980	1.210	0.558
210	4.900	1.130	0.521
240	4.810	1.040	0.479
300	4.688	0.918	0.423
360	4.583	0.813	0.375
420	4.500	0.730	0.336
480	4.400	0.630	0.290
540	4.380	0.610	0.281
600	4.310	0.540	0.249
660	4.270	0.500	0.230
720	4.230	0.460	0.212
780	4.190	0.420	0.194
900	4.150	0.380	0.175
1020	4.100	0.330	0.152
1140	4.060	0.290	0.134
1440	4.020	0.250	0.115
1740	3.980	0.210	0.097

HVORSLEV METHOD SLUG TEST



Date Tested: 7/15/87
Project Number: 12872844
Project Name: ROSE CHEMICAL
Well Number: MW-102
Test Number: T1-REC
REGRESSION # 1

LOWER BOUND: 0 SEC
UPPER BOUND: 432000 SEC
SLOPE: -3.481888E-06
INTERCEPT: 2.061143E-03
CORRELATION: .9957588

Method of Calculation: VARIABLE HEAD
Diameter of well point-filter 21 cm
Length of well point-filter 610 cm
Diameter of standpipe 5.1 cm
H1(ft): 36.62 H2(ft): 1.02
Time difference between H1 and H2 (sec): 432000

Horizontal Permeability 2.811847E-07 cm/sec
Transformation Ratio 10

Method of Calculation: BASIC TIME LAG
Diameter of well point-filter 21 cm
Length of well point-filter 610 cm
Diameter of standpipe 5.1 cm

Horizontal Permeability 2.722453E-07 cm/sec
Basic time lag 124605.1 sec
Transformation Ratio 10

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX G

Shallow Soil Boring Logs

JULY/87/0083s

SERIAL NO. GS______
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-1
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK ______
DATE 6-16-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4½" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB1-1	0800	1000 Ml Jar	2.2	0-10" gravelly topsoil
2	SB1-2	0810	1000 Ml Jar	.8	material CL - organic rich
					dark brown; sandy -
					gravelly clay; fill
					Material
					Rec = 28"

INSTRUMENT READINGS

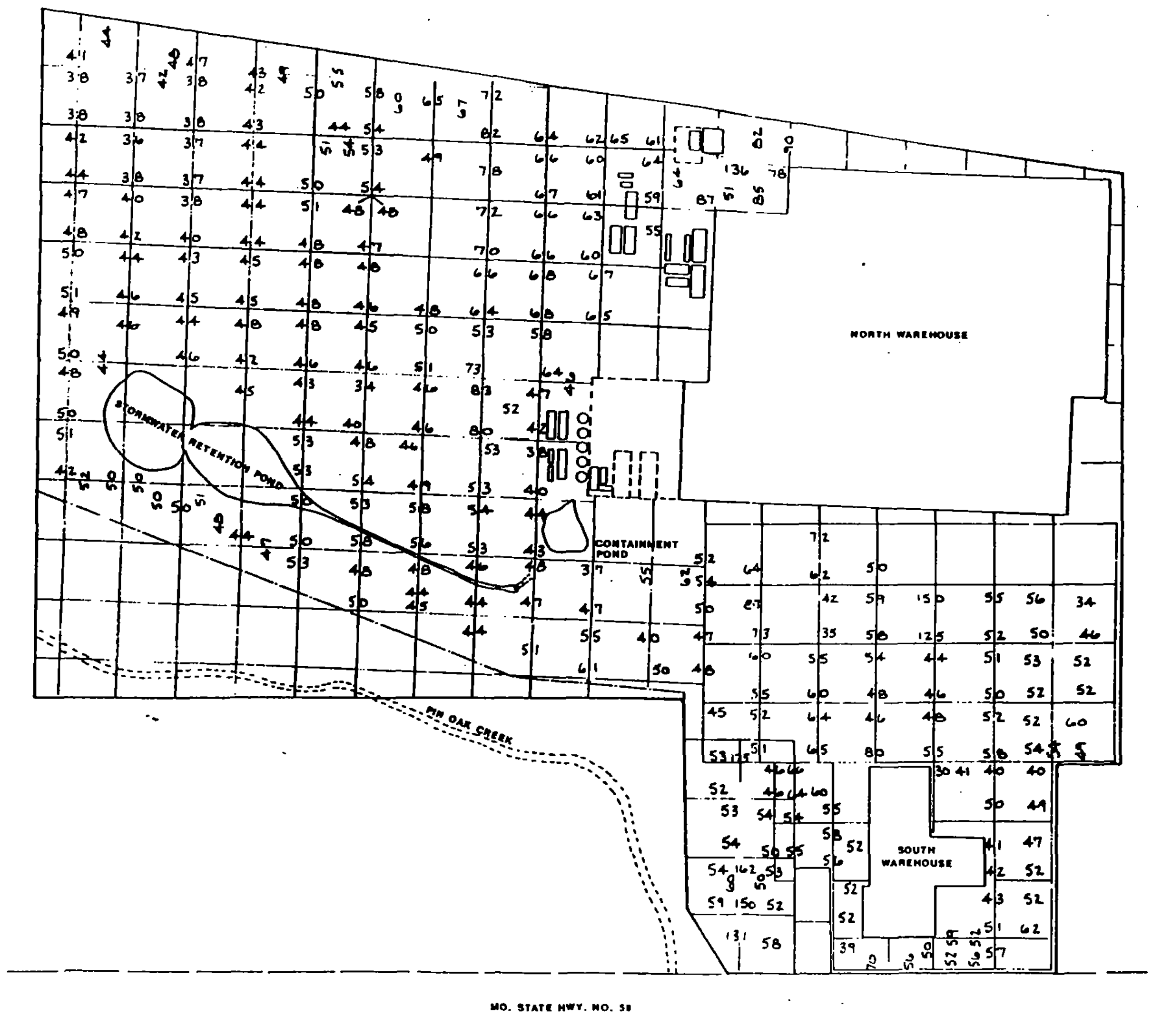
TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	In augers and on sample

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1335 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY



EXPLANATION

45 DENOTES READING OF APPARENT CONDUCTIVITY (mm)

0 100 200
SCALE IN FEET

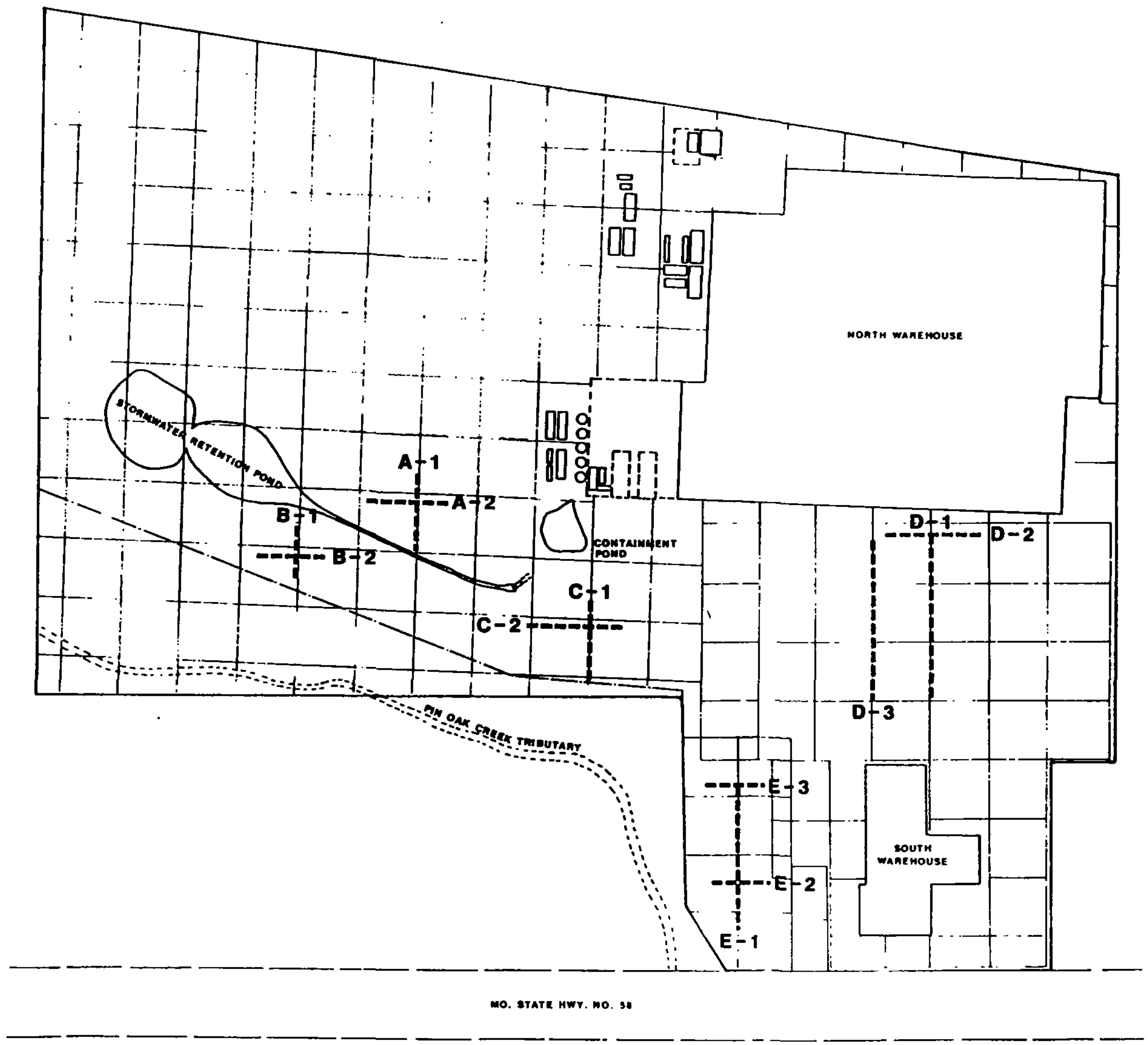
N

John Mathes & Associates, Inc.

SURFACE GEOPHYSICAL SUR Y
EM DATA

12872844

FIGURE I-1



EXPLANATION

C-1 ▬▬ MAGNETOMETER SURVEY LINE (PERFORMED BY JMA)
READINGS IN GAMMAS

AREA A		AREA B		AREA C	
A-1	A-2	B-1	B-2	C-1	C-2
5132	5140	5248	5216	5096	5125
5144	5155	5243	5207	5112	5132
5157	5167	5227	5201	5127	5131
5167	5178	5203	5190	5127	5133
5175	5187	5132	5186	5089	5138
5183	5194	5026	5177	4953	5141
5189	5200	5139			5132

AREA D			AREA E		
D-1	D-2	D-3	E-1	E-2	E-3
4987	4297	4562	5017	4832	4938
5036	4251	4758	5008	4959	4822
5062	4193	4892	5052	5059	4895
5076	4059	4963	5131	5149	4985
5079	4145	5001	5154	5108	5047
5063	4257	5032	5021	5087	5053
5035	4333	5045	4712	5063	
4989		5047	4981		
4939		5056	5101		
4750		5063	5155		
4791		5064	5152		
4275		5054	5012		
3860		5027			
3926					

ARFA F (BACKGROUND)

5319
5318
5314
5310
5314
5302
5308
5307
5300
5311

John Mathes & Associates, Inc.

SURFACE GEOPHYSICAL SURVEY
MAGNETOMETER DATA

12872844

FIGURE I-2

RECEIVED JUL 9 1987

NEPONSET GEOPHYSICAL CORPORATION

July 6,1987

Project No. 87010

Mr. Jeffrey Young
John Mathes and Associates, Inc
210 West Sandbank Road
Columbia, IL 62236

Letter Report
Geophysical Screening using GPR and Magnetics
Rose Chemical Company Site
Holden, Missouri

Dear Mr. Young:

The purpose of this letter report is to present the results of the geophysical screening survey conducted by Neponset Geophysical Corporation(NGC) at the Rose Chemical Company Site, Holden, Missouri on July 1. Methods recommended for use at the site were Ground Penetrating Radar (GPR) and Magnetometry, and the geophysical work at the site was conducted in three tasks in order to:

- Evaluate previous geophysical work at the site,
- Test the geophysical methods over known barrel locations, and
- Conduct a screening survey across areas of potential drum burials.

A geophysical survey was previously conducted at the Rose Chemical site by Mathes that consisted of a Geonics EM31 survey on a 50-foot grid and a magnetometer survey at anomalous locations determined by the EM31 readings. This methodology was successful in determining that extensive trenching did not occur at the Rose Chemical site; however, the survey was not designed to identify small burials (less than approximately 50 feet by 50 feet). The purpose of the NGC activities was to supplement the original geophysical survey by providing a geophysical survey specifically designed to locate and characterize relatively small burials.

The equipment mobilized to the field consisted of a GSSI Model 3 GPR System with a 120 Mhz antenna and a Scintrex MF-2-100 Vertical Gradient Fluxgate Magnetometer. The Fluxgate magnetometer was selected because the instrument is highly effective for rapid screening of buried magnetic objects. The instrument is relatively insensitive as compared with a total field magnetometer, and the fluxgate magnetometer must be positioned within approximately 4 feet of the magnetic body before a magnetic anomaly is detected. As a result, the instrument is effective for locating the edges of a burial containing magnetic material. The GPR 120 Mhz antenna was selected because the antenna provides a good compromise between resolution and depth-of-penetration.

A known barrel located near site coordinate I-6 was used for evaluation and calibration of the geophysical methods. The GPR system was initially tested and was determined to be effective in locating the barrel. The effective depth-of-penetration appeared to be approximately 7 feet, and two additional buried objects of comparable size to the known barrel were detected nearby (within 10 feet). In addition, the fluxgate magnetometer was determined to be effective in detecting the three magnetic objects. Note that the sensitivity of the fluxgate magnetometer is dependent on the amount of magnetic material at the surface; large concentrations of surface debris cause significant noise levels, and the size of a buried object(s) must be correspondingly larger if located near surficial debris. In general, the minimum detectable burial size for the fluxgate magnetometer at this site is estimated to be three to four drums.

The survey methodology consisted of using the fluxgate magnetometer for areal screening of potential burials, and the GPR was subsequently used to characterize the subsurface of the magnetic anomalies. Figure 1 is a sketch of the areas covered with the fluxgate magnetometer, and the background readings typically ranged from 500- to 1200-gammas. Anomalies were identified by increased variability of the readings (typically -2000 to 3000 gammas), and three anomalous areas were identified for further investigation with the GPR. The remainder of the surveyed area had no detectable burials of magnetic materials.

Referring to Figure 2, four GPR profiles were obtained across Area A, and the area was characterized as a trench due to the lack of continuity of stratigraphic layers in the area. The excavation is oriented in the north/south direction and the dimensions are approximately 25 feet wide by 35 feet long. The burial appears to contain at least three objects that are of similar size of waste drums; however, the excavation does not appear to be filled with metallic objects. Note that the GPR was not capable of surveying deeper than 7 feet at the site, and additional objects may be present if the trench is deeper than the range of the GPR.

Area B was surveyed using four GPR profiles (Figure 3), and no evidence of subsurface disturbance or buried objects were detected. The magnetic anomaly was apparently caused by the surface scrap metal as well as interference from the cyclone fences. Area C was determined to be caused by utilities and was not further investigated with the GPR unit.

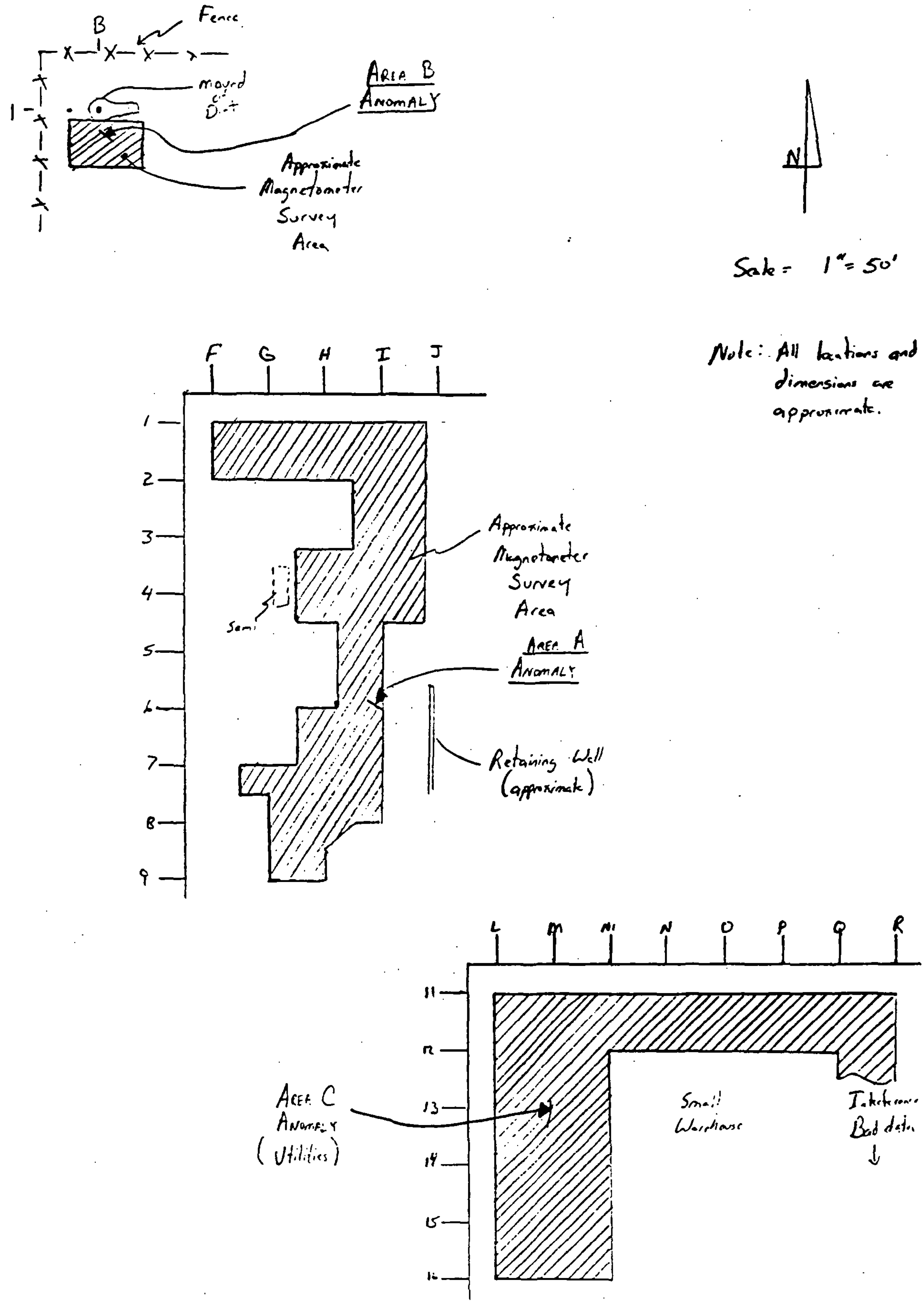
A geophysical survey was provided by NGC to supplement the original survey conducted by Mathes. The purpose of the first geophysical survey was to determine if large scale trenching operations occurred at the Rose Chemical site, and the supplementary survey by NGC was conducted to identify isolated burials that appear to exist. The instruments utilized consisted of a fluxgate magnetometer and a GPR system, and based on the results of the field work, a relatively small trench containing metallic objects was located near coordinate I-6. No additional burials appear to exist within the surveyed area. The level of effort and results of the two geophysical studies conducted to date are appropriate for the current concerns and goals at the Rose Chemical site. Additional geophysical work is possible at the site to provide improved detail of subsurface conditions, but this work will cause a substantial increase in the level of effort required. Based on our understanding of the project goals and requirements, no additional geophysical work is recommended at this time; however, future data or findings at the site may justify the use of additional geophysical work.

If you have any questions or comments, please call me.

Respectfully submitted,

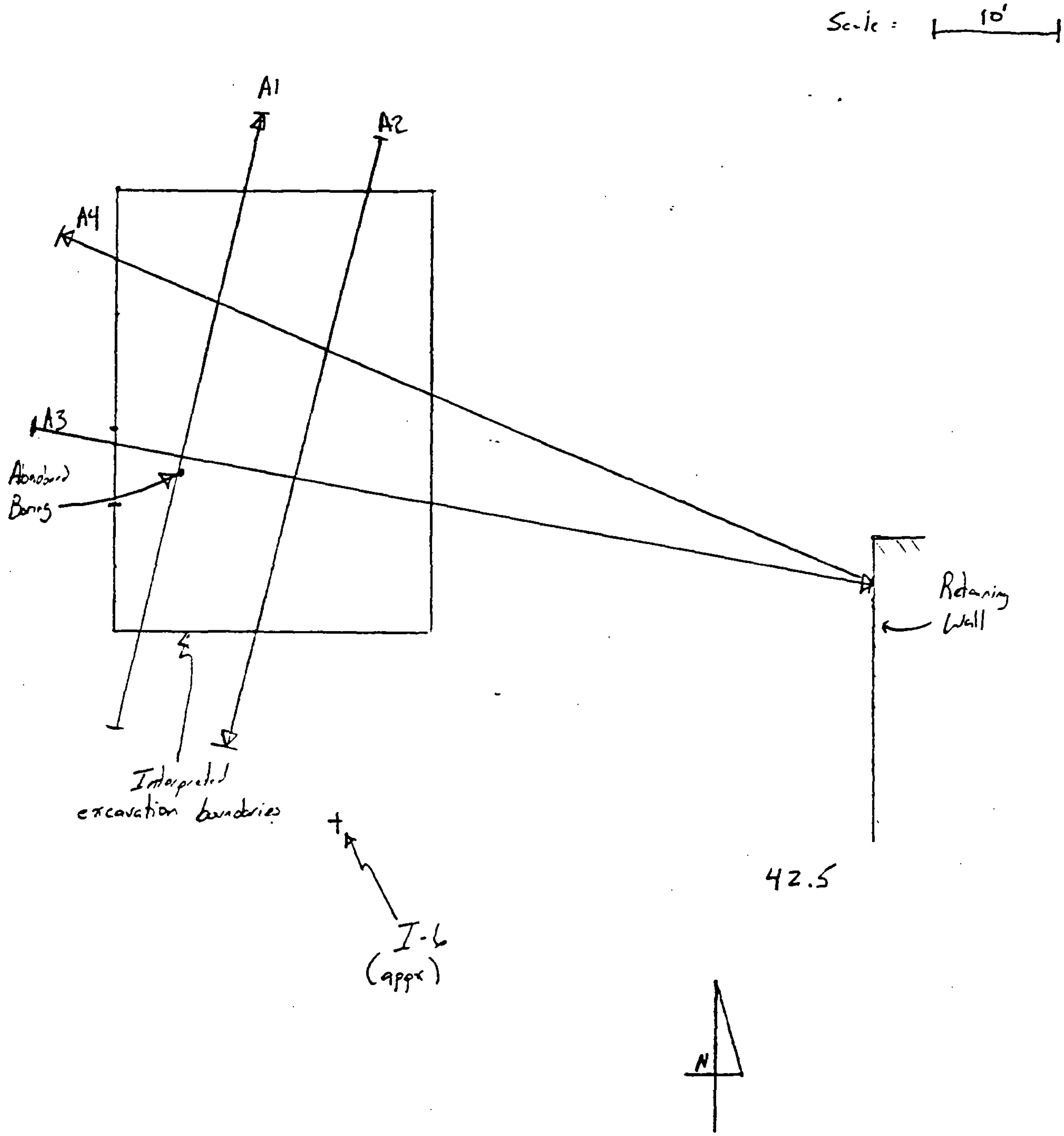
Thomas A. Brooks
President

Rose Chemical Site Holden, Mo	Area of magnetometer Screening Sketch Map	July [illegible], 1987

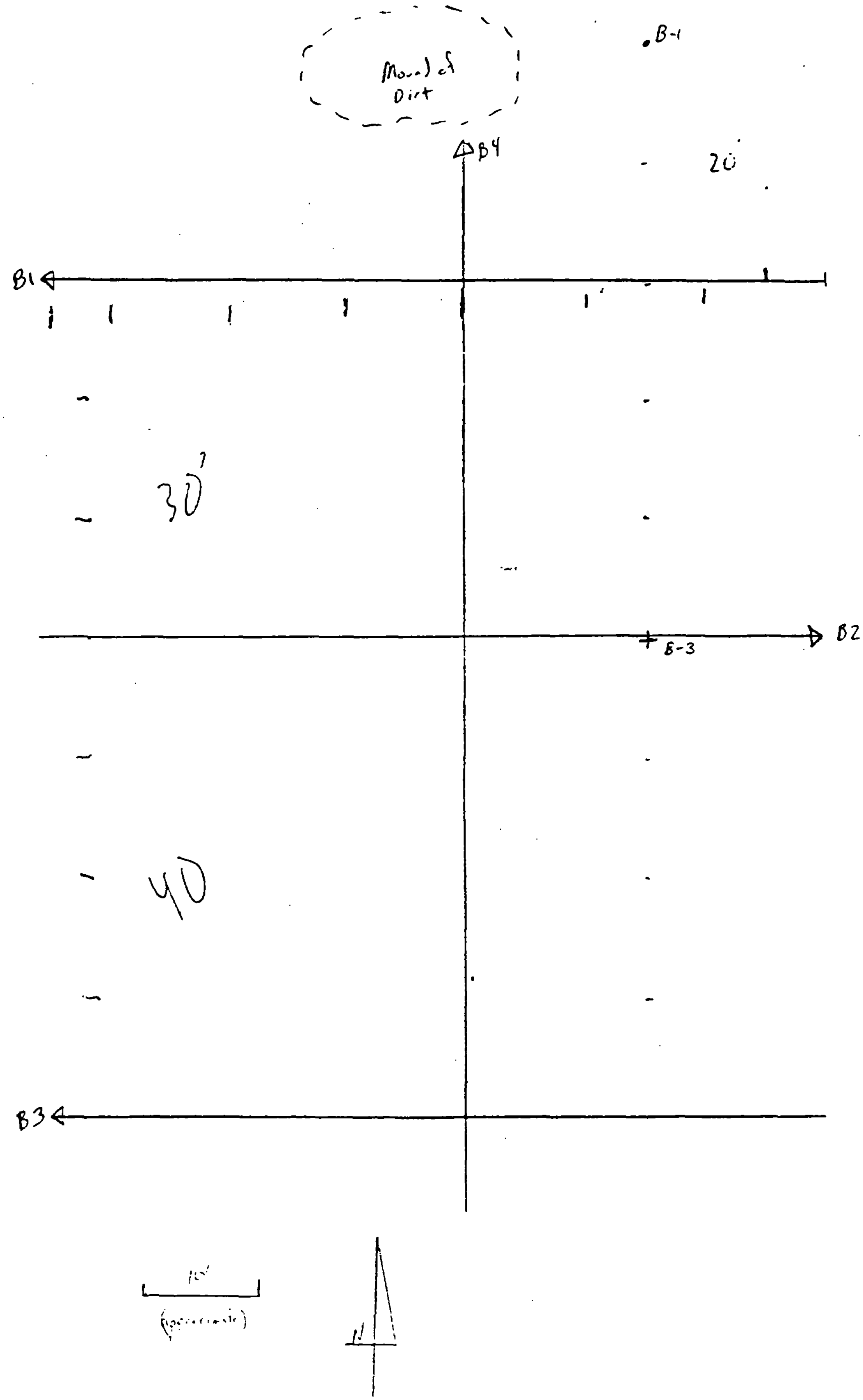


Rose Chemical Site
Holden Mo

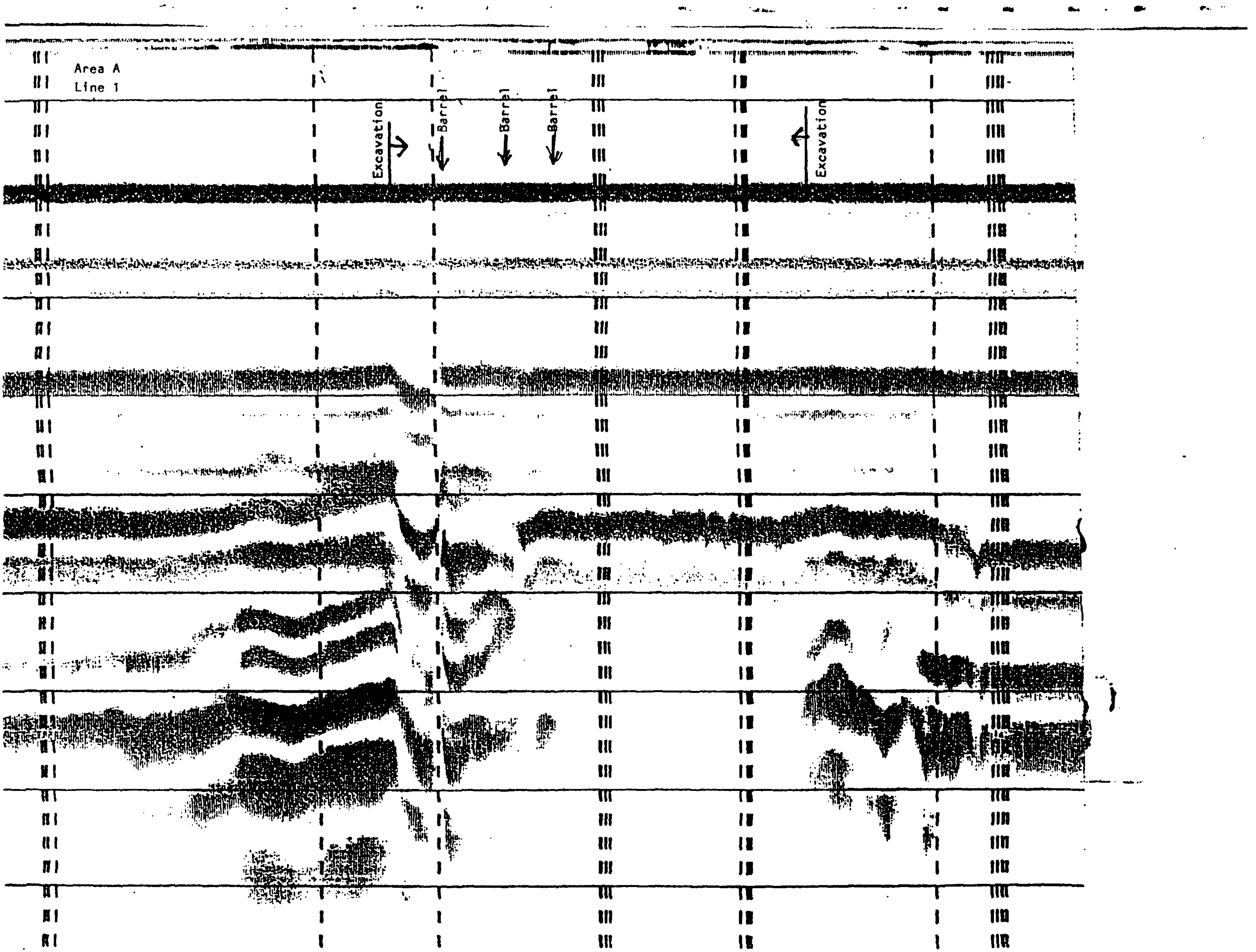
Area A

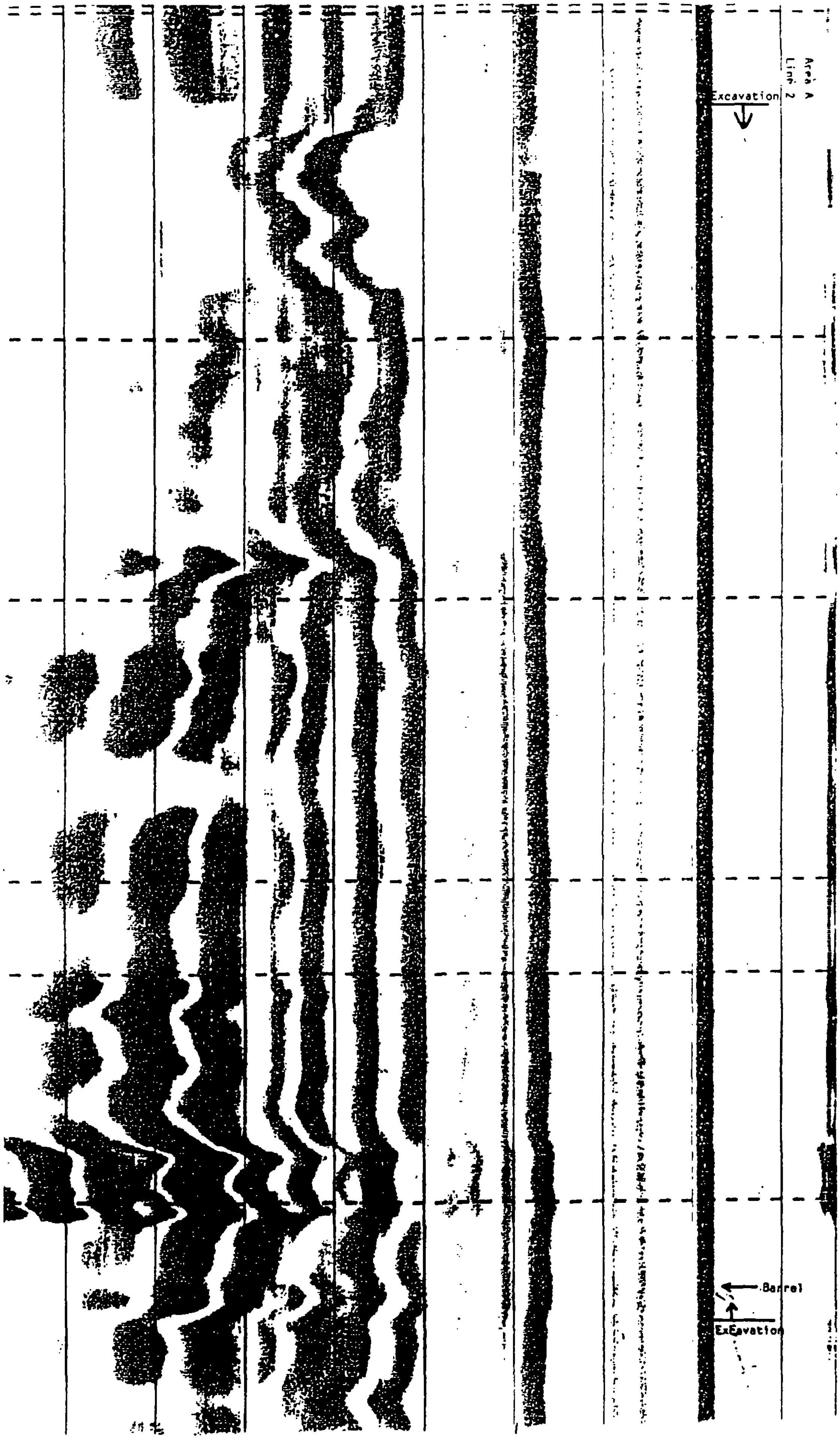


Rose Chemical Site Holden Mo	Area B GPR Profiles	July 6, 1987

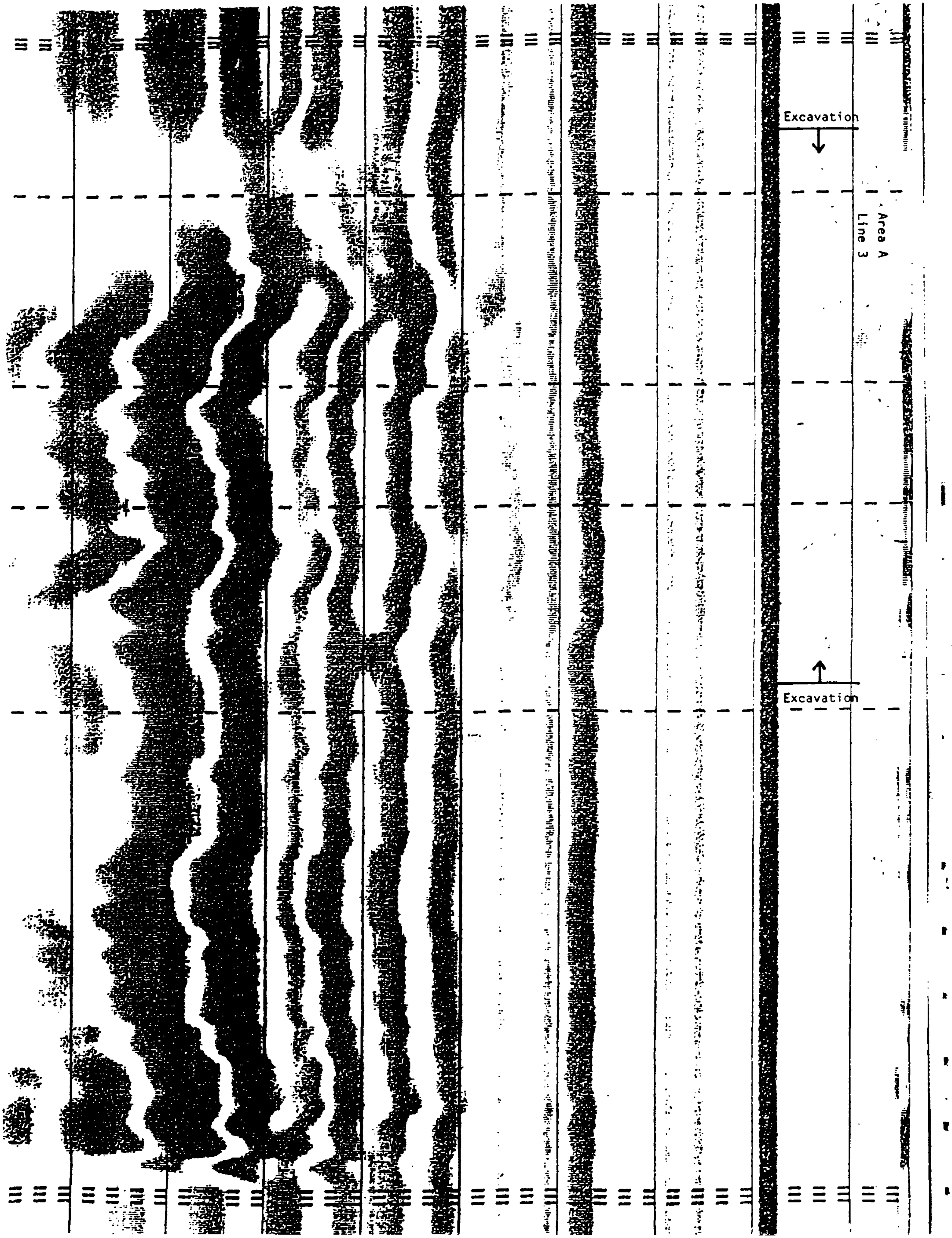


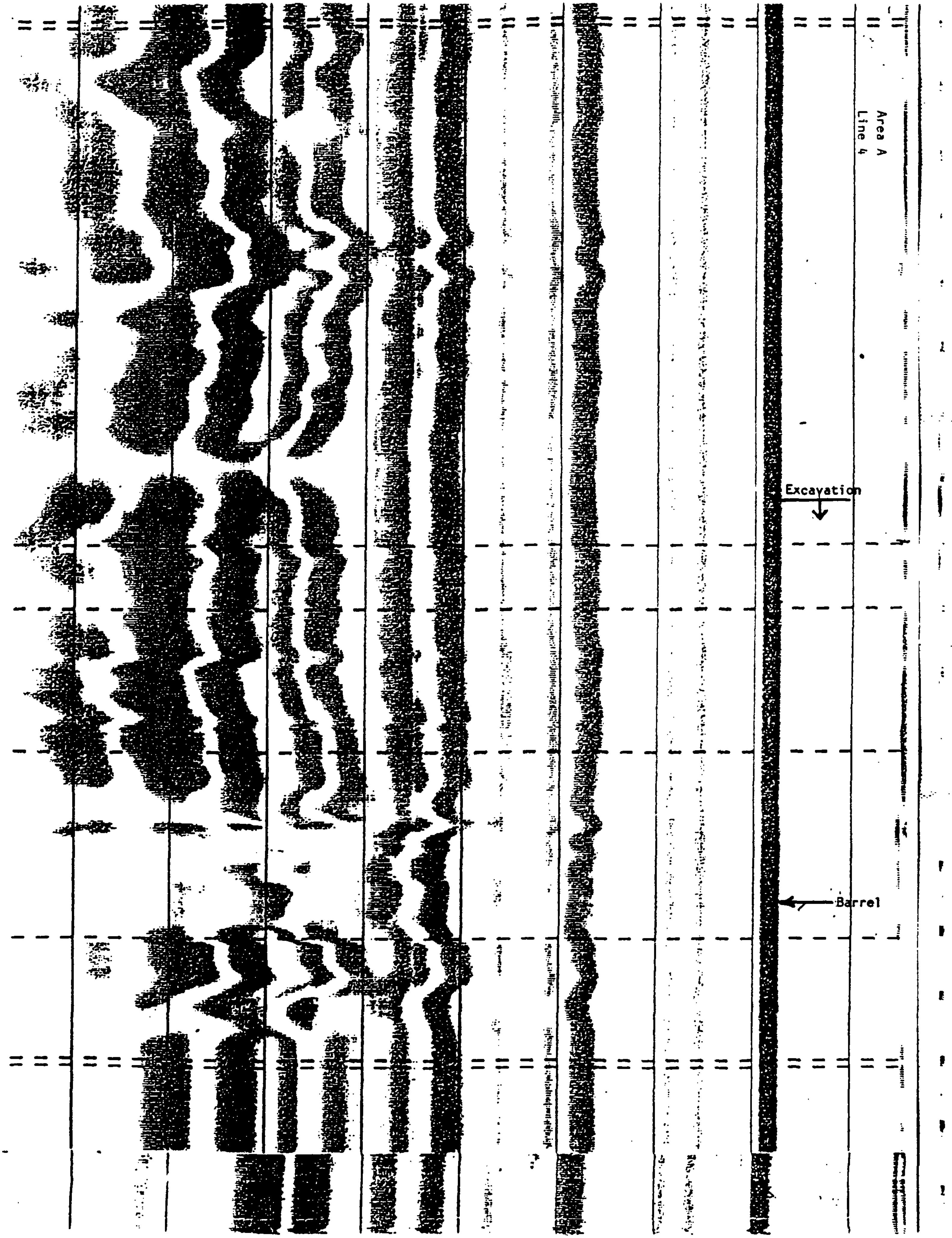
Made in U.S.A.

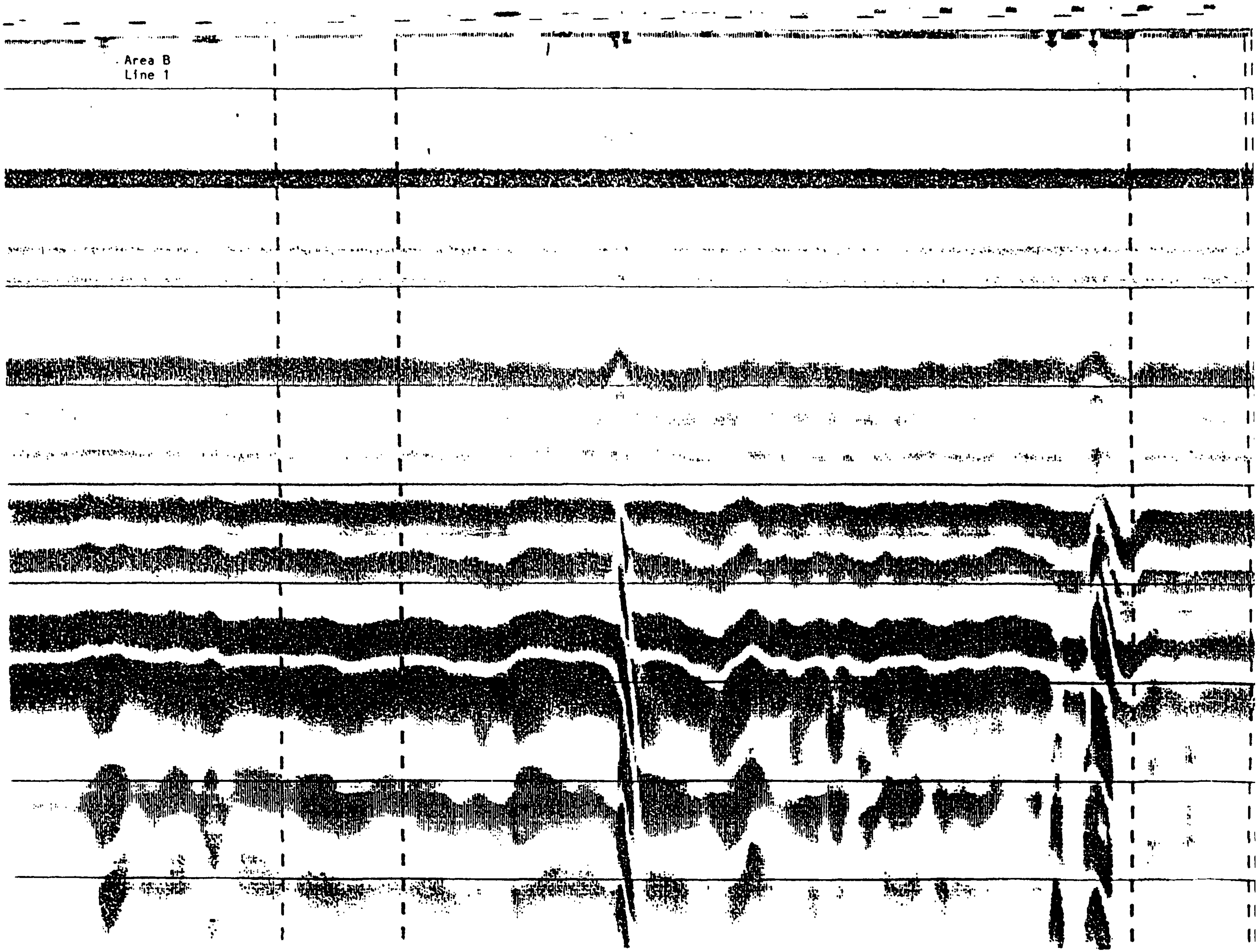

Area A
Line 1
Excavation
Barrel
Barrel
Barrel
Excavation



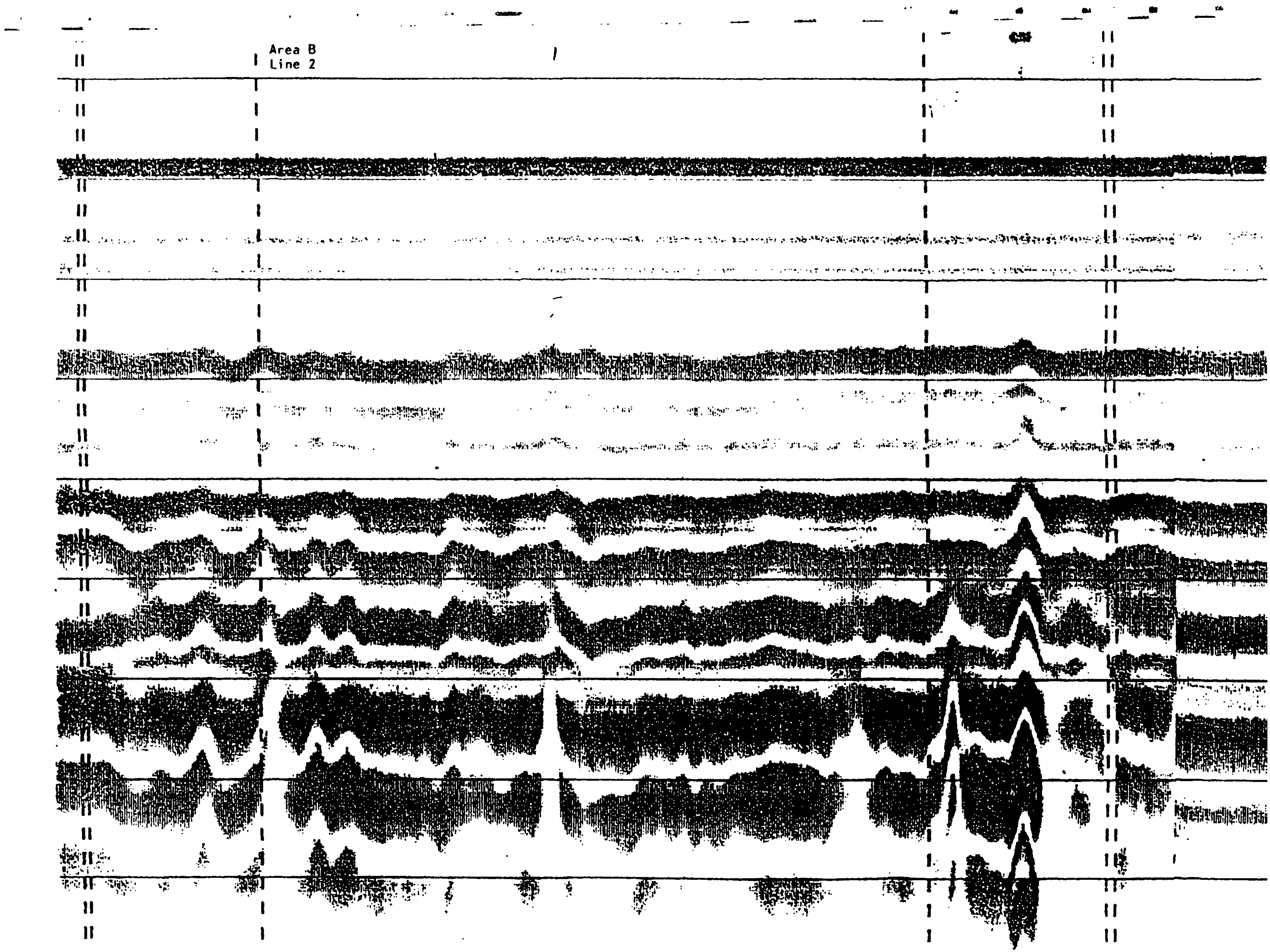
Area A
Line 2
Excavation
Barrel
Excavation

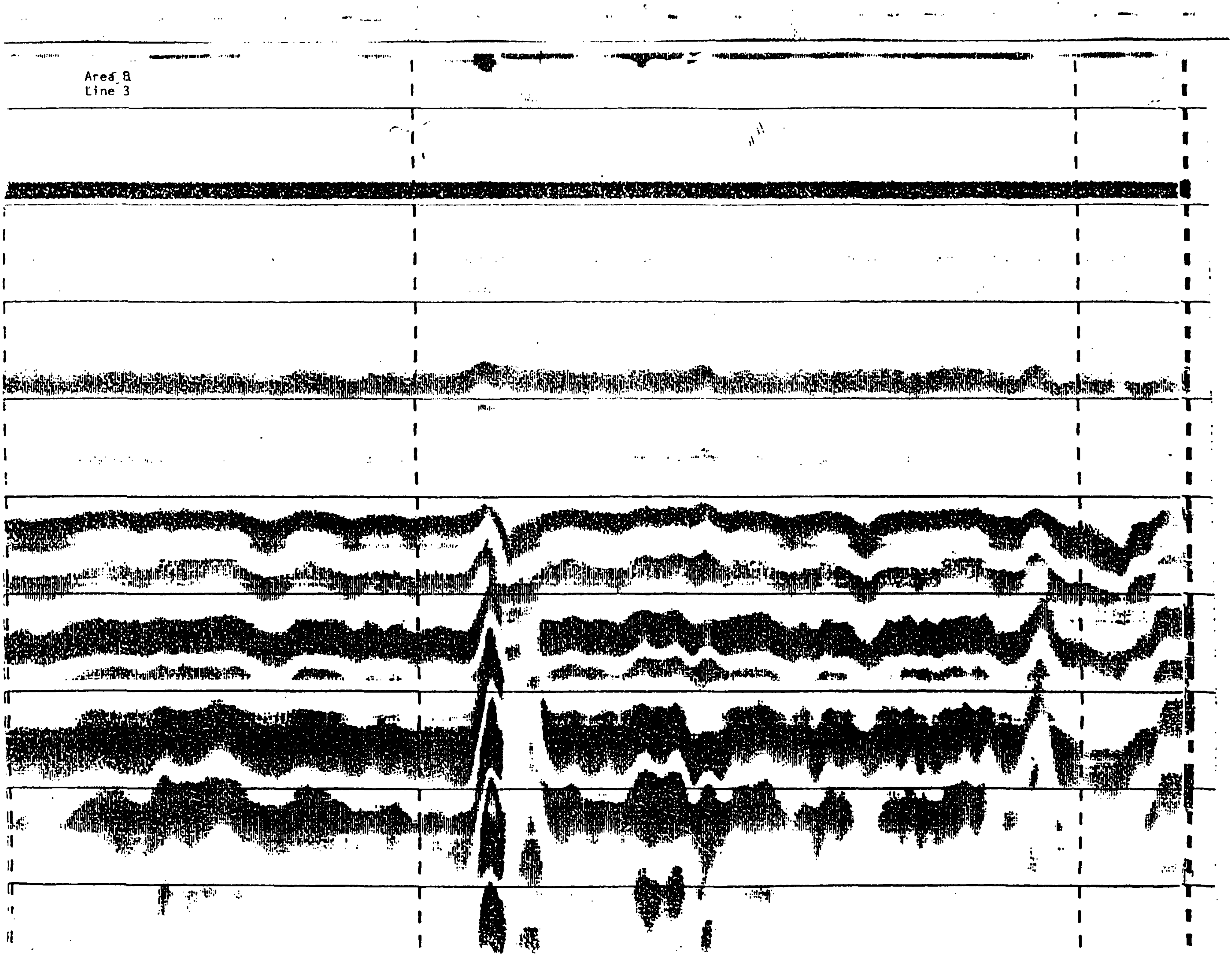

Excavation
Area A
Line 3
Excavation


Area A
Line 4
Excavation
Barrel

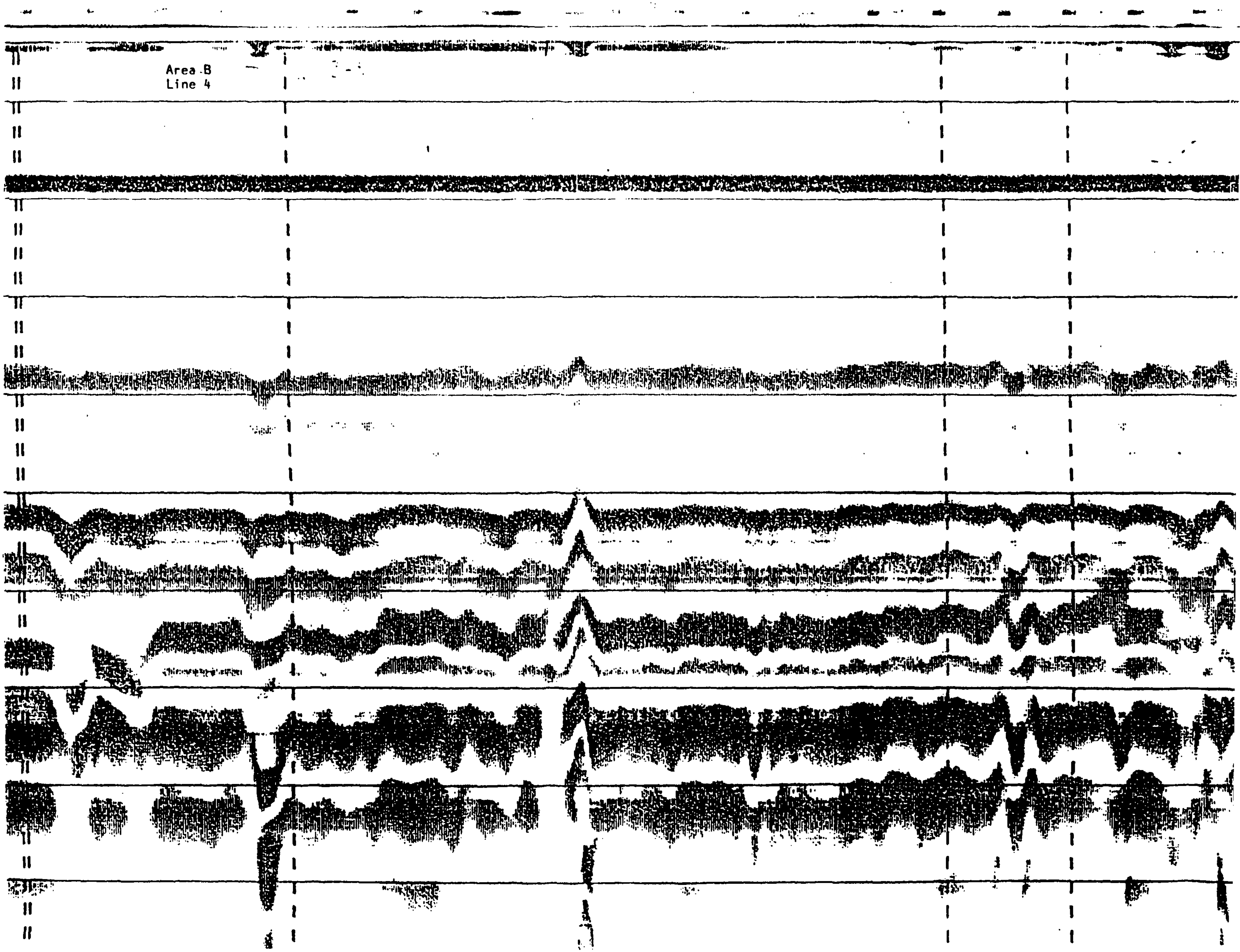


Area B
Line 1


Area B
Line 2



Area B
Line 3



Area B
Line 4

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX J

Analytical Data

JULY/87/0083s

LANGSTON LABORATORIES, INC.
Research • Testing • Problem Solving
2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 29, 1987 (5:00 pm)
COMPLETED: July 10, 1987

LLI NO.: 87-2808
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-2A	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-2A	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls Aroclor 1254	260 mg/kg

LANGSTON LABORATORIES, INC.
Research • Testing • Problem Solving
2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. 210 W. Sandbank Road Columbia, IL 62236	RECEIVED: COMPLETED:	June 29, 1987 (5:00 pm) July 10, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2808 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-3	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-3	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	0.80 mg/kg
	Aroclor 1260	1.5 mg/kg

LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 29, 1987 (5:00 pm)
COMPLETED: July 10, 1987
LLI NO.: 87-2808
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-4	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	1.3 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	8.6 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-4	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	0.47 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. 210 W. Sandbank Road Columbia, IL 62236	RECEIVED: COMPLETED:	June 29, 1987 (5:00 pm) July 10, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2808 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-5	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-5	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	37.0 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	105 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	430 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	76 mg/kg
	Aroclor 1260	227 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 29, 1987 (5:00 pm)
COMPLETED: July 10, 1987

LLI NO.: 87-2808
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-6	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	2.7 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	68 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	0.366 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-6	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	44 mg/kg
	Aroclor 1254	39 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
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ATTN: Jeffrey D. Young

RECEIVED: June 29, 1987 (5:00 pm)
COMPLETED: July 10, 1987
LLI NO.: 87-2808
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-7	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from [illegible]e Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-7	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	22 mg/kg
	Aroclor 1254	8.5 mg/kg

SERIAL NO. GS
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-2
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK
DATE 6-16-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4-1/4" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB 2-1	0710	1000 ml jar	4.5+	0-1' Gravel Fill Material
2	SB 2-2	0720	1000 ml jar	4.5+	CL - Brown Mottled
					gravelly clay w/silt and
					sand
					Fill Material
					Rec = 24"

Auger Refusal @ 32"

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	On sample and in augers

DOCUMENTATION

SAMPLE SEALED YES/NO ___ TIME ___ SEALER

COC COMPLETED YES/NO 1335 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ___ LAR NO. ___ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS
PAGE 1 OF

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-3
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-16-87 SAMPLERS T. Fuhrhop / C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB3-1	0555	1000 ML Jar	2.75	0-6" Gravel-fill material
* 2	SB3-1D	0555	1000 ML Jar	2.75	0.5-3.5' CL-gray
3	SB3-2	0605	1000 ML Jar	1.25	brown; gravel-organics
					dark brown; organic rich,
					gravel. Refusal @ very
					coarse L.S. (2" diameter)
					Rec. = 30"

* Duplicate EPA Sample

Auger Refusal @ 3.5'

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	100/400 Peak-augers	In augers and on samples.
		1.5/2.5 Peak-	
		work space	
		1.5 Sample	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 1335 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS____
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-04
PROJECT NO. 12862844 MAJOR TASK 2331 SUBTASK -
DATE June 10, 1987 SAMPLERS T. Fuhrhop/C. HEbel

SAMPLING METHOD 4-1/4" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE x
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
TEF 1	SB4-1	1250	1000 ml jar	1.8	0-2' CL dk brown - topsoil
TEF 2	SB4-2	1310	1000 ml jar	1.6	mat.-rooted-some Fe stains
3	SB4-3	1325	1000 ml jar	2.3	2'-5' CL-gray br-increased
					Fe stains
					Rec = 57"

Sample taken - stored on site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	In augers and on sample
HNU	601024	0 ppm	

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1600 TIME N/A COC NO. T.E.F. COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc TIME ____ LAR NO. ____ COMPLETED BY

SERIAL NO. GS
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-5
PROJECT NO. 12872331 MAJOR TASK 2331 SUBTASK -
DATE 6-10-87 SAMPLERS T. Fuhrhop / C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB5-1	1500	1000 ML Jar	-	CL-Red brown-possible fill-
2	SB5-2	1515	1000 ML Jar	3.3	brick frags & charcoal frags-
+ 3	SB5-3	1530	1000 ML Jar	4.5	very stiff slightly rooted-
					trace Fe stains.
					Rec.=52"

+ Sample taken-stored on site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	In augers and on sample
HNU	601024	0 ppm	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 1600 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME _____ LAR NO. _____ COMPLETED BY

SERIAL NO. GS______
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-6
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-23-87 SAMPLERS T. Fuhrhop / C. Hebel

SAMPLING METHOD 4½" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
* 1	SB6-1	0700	1000 ML Jar	2.7	Gravel & roadway material
* 2	SB6-2	0720	1000 ML Jar	3.1	1' CL.: Dark brown
+ * 3	SB6-3	0730	1000 ML Jar	2.5	topsoil, brown silty-clay
					some sand; brown-gray
					mottled clay w/sand and
					gravel.
					Rec.=52"

* Duplicate EPA Sample
\+ Sample taken-stored on site.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	On sample and in augers.

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER
COC COMPLETED YES/NO 1300 TIME N/A COC NO. TEF ________ COMPLETED BY
LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS______
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-7
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/22/87 SAMPLERS T. Fuhrhop/ C. Hebel

SAMPLING METHOD 4-1/4" Hollow split tube
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

	SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	OP	SAMPLE DESCRIPTION
*	1	SB 7-1	1305	1000 ml jar	N/A	CL- Dk Brn sandy clay
*	2	SB 7-2	1320	1000 ml jar	2.5	Organics (rooted); some
						gravel, gray brown clay-
						stiff; gravel and Fe Stains
						REC= 27"

* Duplicate EPA sample

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	10/30 peak-Augers	Readings off sample and out of
		.5- Workspace	augers.
		2.5/3.5 peak-sample	

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1430 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME____ LAR NO.____ COMPLETED BY

SERIAL NO. GS______
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-8
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-23-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4-1/4" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

	SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
*	1	SB8-1	0415	1000 ml jar	2.8	CL - Dark brown silty clay
*	2	SB8-1D	0415	1000 ml jar	2.8	grading to a brown gray
*	3	SB8-2	0430	1000 ml jar	2.0	mottled clay; gravel,
+	4	SB8-3	0440	1000 ml jar	2.8	upper material organic
						rich.
						Rec. 57"

* duplicate EPA sample
\+ sample taken - stored on site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	On sample and in augers

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER
COC COMPLETED YES/NO 1300 TIME N/A COC NO. TEF COMPLETED BY
LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

Mathes

SHALLOW SOIL BORING

SERIAL NO. GS____
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-9
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-14-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4½" Hollow Split Barrel
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB9-1	1115	1000 ML Jar	4.2	CL, Brown-gray: silty
2	SB9-2	1125	1000 ML Jar	4.5+	organic material: Fe
+ 3	SB9-3	1140	1000 ML Jar	4.5+	stains
					Appears to be Fill
					Material layed down in
					½"-1" lifts (layered
					sample).
					Rec. = 50"

\+ Sample taken - stored on site.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
HNU	50323	0 ppm	In augers and on samples.
OVA	601024	0 ppm	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 0350 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc TIME_____ LAR NO._____ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-10
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-14-87 SAMPLERS T. Fuhrhop / C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB10-1	1210	1000 ML Jar	2.1	CL-brown; silty; trace gravel;
2	SB10-2	1220	1000 ML Jar	2.6	Fe stains; black charcoal
+ 3	SB10-3	1230	1000 ML Jar	2.75	material near bottom
					Rec.=48"

+ Sample taken-stored on site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
HNU	50323	0 ppm	In augers and on sample.
OVA	601024	0 ppm	

DOCUMENTATION

SAMPLE SEALED YES/NO ___ TIME ___ SEALER
COC COMPLETED YES/NO 0350 TIME N/A COC NO. TEF COMPLETED BY
LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ___ LAR NO. ___ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS ______
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-11
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-23-87 SAMPLERS T. Fuhrhup / C. Hebel

SAMPLING METHOD 4½" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE x
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

	SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
	1	SB11-1	1010	1000 ML Jar	-	Gravel & soil roadway
*	2	SB11-2	1030	1000 ML Jar	1.9	1.5' CL Brown gray
	3	SB11-3	1040	1000 ML Jar	1.8	molted clay; red Fe stains;
						trace gravel; black charcoal
						material
						Rec. = 57"

* Duplicate EPA sample
\+ Sample taken - stored on site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	In augers and on samples

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER
COC COMPLETED YES/NO 1300 TIME N/A COC NO. TEF COMPLETED BY
LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ____ LAR NO. ____ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-12
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-23-87 SAMPLERS T. Fuhrhop / C. Helel

SAMPLING METHOD 4½' Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

	SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
*	1	SB12-1	1120	1000 ML Jar	1.4	Visible red contamination
*	2	SB12-2	1130	1000 ML Jar	1.8	16"
*	3	SB12-3	1140	1000 ML Jar	2.0	CL. Brown mottled clay;
						organics, visible con-
						tamination; @ 20" Dark
						brown organic rich topsoil
						material.
						Rec-51"

* Duplicate EPA Sample
\+ Split sample-stored on site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	90/120 Peak-augers	On sample and in augers.
		0.5/1.5 Peak-	
		work space	
		10/70 Peak-sample	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 1300 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

SHALLOW SOIL BORING

SERIAL NO. GS______
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-13
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK ______
DATE 6-16-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4'¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB___ BACKGROUND___ COMPOSITE x
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	Qp	SAMPLE DESCRIPTION
1	SB13-1	1155	1000 Ml Jar	4.5+	CL - dark brown clay; Fe
2	SB13-1D	1155	1000 Ml Jar		stains - trace gravel.
3	SB13-2	1210	1000 Ml Jar	2.3	At 2' Red brown mottled
+ 4	SB13-3	1220	1000 Ml Jar	1.25	clay - Fe stains - trace
					gravel
					Rec.=56"

+ - Sample taken - stored on site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	In augers & on sample

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1335 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME______ LAR NO.______ COMPLETED BY

SERIAL NO. GS
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-14
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK
DATE - 6-17-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB14-1	0400	1000 ML Jar	1.8	CL
2	SB14-2	0410	1000 ML Jar	1.75	dk brown; rooted; some
					gravel; L.S. Frags in shoe,
					Fill material.
					Rec. = 24"

Auger Refusal @ 3'

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	601024	0.5 - 1.5 Augers	0 in work space
		0 - Workspace	1.5 peek, .5 contant in augers
		0-Sample	
			* Moisture too high for HNU to be

effective.

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 0445 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS____
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-15
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/22/87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4-1/4" Hollow split tube
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB 15-1	0750	1000 ml jar	4.5+	Dk Brn; Rooted; CL; some
2	SB 15-2	0805	1000 ml jar	4.5+	sand and gravel; 2'-brown
+ 3	SB 15-3	0830	1000 ml jar	3.2	gray gravelly clay to
					brown gray weathered shale
					@ 4'
					Rec.=52"

\+ Sample taken-stored at site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	Readings taken in augers and on
			samples

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 1430 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME_____ LAR NO._____ COMPLETED BY

SERIAL NO. GS
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-16
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/22/87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4-1/4 Hollow split tube
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SE 16-1		1000 ml jar	N/A	Gravel and roadway material,
2	SB 16-2		1000 ml jar	4.5+	CL; Brown gray silty sandy
					clay- trace gravel- Fill
					material (½"-1" lifts)
					REC. = 24"

Auger Refusal @ 3'3"

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	Readings in augers and on sample

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1430 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS_ ___
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB17(TB2)
PROJECT NO. 12872844 MAJOR TASK 2332 SUBTASK -
DATE June 14, 1987 SAMPLERS T Fuhrhop/C. Hebel

SAMPLING METHOD 4-1/4" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
1	TB2-1	0505	1000 ml jar	CL - gray brown; mottled
2	TB2-1D	0505	1000 ml jar	Fe stains; trace gravel
3	TB2-2	0525	1000 ml jar	stiff - dry; black charcoal
+ 4	TB2-3	0535	1000 ml jar	material.
				Rec. = 54"

\+ Sample taken - stored on site

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
HNU	50323	0 ppm	In augers and on sample
OVA	601024	0 ppm	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 0945 TIME N/A COC NO. T. Fuhrhop COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

SERIAL NO. GS______
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-18
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK ______
DATE 6-23-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

	SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
*	1	SB18-1	0550	1000 ML Jar	3.1	Gravel Fill material .5'
*	2	SB18-2	0600	1000 ML Jar	3.5	Red brown clay shale
						changing to gray shale with
						clay pertings; weathered
						Rec. = 40"

* duplicate EPA sample.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
VOA	50323	Oppm	On sample and in augers

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1300 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

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SHALLOW SOIL BORING

SERIAL NO. GS ________
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-19
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK ________
DATE 6-17-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB ____ BACKGROUND ____ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ____ PHYSICAL TESTING ____

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	Qp	SAMPLE DESCRIPTION
1	SB19-1	0810	1000 ML Jar	1.5	CL-dark brown organic rich
2	SB19-10	0810	1000 ML Jar	1.5	(roots)-grades to brown
3	SB19-2	0825	1000 ML Jar	.7	mottled with gravel, no roots,
4	SB19-3	0840	1000 ML Jar	1.4	black charcoal material at
					4.5'
					Rec. = 60"

\+ Sample taken - stored on site.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	Oppm	On sample and in augers

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 1105 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

SERIAL NO. GS ______
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB20(TB3)
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-9-87 SAMPLERS T. Fuhrhop / C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB ___ BACKGROUND ___ COMPOSITE x
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	T.B. 3-1	1350	1000 ML Jar		CL-brown gray sand; silty;
2	T.B. 3-10	1350	1000 ML Jar	3.75	Fe stains
3	T.B. 3-2	1410	1000 ML Jar		
* 4	T.B. 3-25	1410	1000 ML Jar		
					Rec.=54"

* Duplicate EPA Sample

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	No readings in augers or on samples.
HNU	601024	0 ppm	

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1545 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

SHALLOW SOIL BORING

SERIAL NO. GS ______
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-21
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-17-87 SAMPLERS T. Fuhrhop / C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB21-1	0920	1000 ML Jar		CL-
2	SB22-2	0935	1000 ML Jar	4.5+	0-12"-top fill material-clay
					& Gravel.
					12"-21" brown-gray; mottled,
					hard & dry
					Rec.=35"

Auger Refusal @ 4.5'

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	Readings taken on samples and in
			augers

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1105 TIME N/A COC NO. TEF ______ COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

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SHALLOW SOIL BORING

SERIAL NO. GS.____
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-22
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/10/87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4-1/4" Hollow split tube
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB 22-1	0540	1000 ml jar	-	CL-Dk brown; rooted
2	SB 22-2	0545	1000 ml jar	4.0	gravel; fill material;
					very dry.

Auger Refusal @ 3'

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	In augers and on sample
HNU	601024	0 ppm	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 1600 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME _____ LAR NO. _____ COMPLETED BY

SERIAL NO. GS
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-23
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK
DATE 6-22-87 SAMPLERS T. Fuhrhop / C. Hebel

SAMPLING METHOD 4½" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	SB23-1	0650	1000 ML Jar	1.8	Gravel & Fill Soils; At 1'
2	SB23-1D	0650	1000 ML Jar		CL-Dark brown silty sandy
3	SB23-2	0705	1000 ML Jar	2.25	clay-some gravel; rooted;
* 4	SB23-2S	0705	1000 ML Jar		red Fe stains; At 4'-gray
					brown weathered shale-red
					Fe stains between layers.
					Rec=38"

* Duplicate EPA sample

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	On sample and in augers.

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER
COC COMPLETED YES/NO 1430 TIME N/A COC NO. TEF COMPLETED BY
LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

SERIAL NO. GS______
PAGE 1 OF 1

SHALLOW SOIL BORING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB-24
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK ______
DATE 6-16-87 SAMPLERS T. Fuhrhop/C. Hebel

SAMPLING METHOD 4½" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

	SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
	1	SB24-1	1050	1000 ML Jar	1.3	0-1' - Gravel & clay
*	2	SB24-1D	1050	1000 ML Jar		driveway material
	3	SB24-2	1105	1000 ML Jar	.75	1"-5' CL-brown mottled
+	4	SB24-3	1115	1000 ML Jar		clay; high % L.S. frags
						(½"-1" diameter); very
						moist
						Rec.=39"

* Duplicate EPA sample

\+ sample taken - stored on site.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	0 ppm	In auger and on sample

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1335 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

mathes

SHALLOW SOIL BORING

SERIAL NO. GS______
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. SB25(TB1)
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 6-10-87 SAMPLERS T. Fuhrhop / C. Hebel

SAMPLING METHOD 4¼" Hollow Split Tube
TYPE OF SAMPLE: DUPLICATE X GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	QP	SAMPLE DESCRIPTION
1	TB1-1	0730	1000 ML Jar	3.5	CL, dk brown, silty sandy
2	TB1-1D	0730	1000 ML Jar		trace gravel, rooted trace
3	TB1-2	0750	1000 ML Jar		Fe stains
* 4	TB1-2S	0750	1000 ML Jar		
					Rec=34"

* Duplicate EPA Sample

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
HNU	50323	0 ppm	In augers and on sample.
OVA	601024	0 ppm	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER
COC COMPLETED YES/NO 1600 TIME N/A COC NO. TEF COMPLETED BY
LAB ANALYSIS REQUEST COMPLETED On Coc. TIME _____ LAR NO. _____ COMPLETED BY

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX H

Warehouse Shallow Soil Boring Logs

mathes

WAREHOUSE SOIL SAMPLING

SERIAL NO. GS______
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. BS-1
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/29/87 SAMPLERS T. Fuhrhop/E. Ahlgren

SAMPLING METHOD 2' Split spoon sampler.
TYPE OF SAMPLE: DUPLICATE___ GRAB___ BACKGROUND___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE___ PHYSICAL TESTING___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
				Buried sump pit - no sample
				available.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	N/A - Sample	Below concrete, on sample and in
		N/A-Below Concrete	workspace.
		0 - Work Space	

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO N/A TIME ______ COC NO. ______ COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED N/A TIME ______ LAR NO. ______ COMPLETED BY

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WAREHOUSE SOIL SAMPLING

SERIAL NO. GS ____
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. BS-2A
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/28/87 SAMPLERS T.Fuhrhop/E.Ahlgren

SAMPLING METHOD 2' Split spoon sampler.
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
1	BS-2A	11:30	1000 ml jar	Green gray silty clay

Duplicate EPA sample.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	5-30 Below Concrete	Below concrete, on sample and in
		7- On Sample	workspace.
		4.0- Work Space	

DOCUMENTATION

SAMPLE SEALED YES NO ________ TIME ________ SEALER

COC COMPLETED YES NO 1600 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME _____ LAR NO. _____ COMPLETED BY

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WAREHOUSE SOIL SAMPLING

SERIAL NO. GS ________
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. BS-3
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/29/87 SAMPLERS T. Fuhrhop/E. Ahlgren

SAMPLING METHOD 2' Split spoon sampler.
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
* 1	BS-3	10:10	1000 ml jar	Green gray silty clay

* Duplicate EPA sample.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	6.5-7.0 Below	Below concrete, on sample and in
		Concrete	workspace.
		N/A on sample	
		2-5.5 Workspace	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 1600 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED Cr. Coc. TIME ______ LAR NO. ______ COMPLETED BY

mathes

SERIAL NO. G
PAGE 1 OF 1

WAREHOUSE SOIL SAMPLING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. BS-4
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/29/87 SAMPLERS T. Fuhrhop/E. Ahlgren

SAMPLING METHOD 2' Split Spoon Sampler
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
1	BS-4	10:00	1000 ml jar	Green gray silty clay

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	4-4.5 Below	Below concrete, on sample and in
		Concrete	workspace.
		N/A- Sample	
		2-3.5 Work Space	

DOCUMENTATION

SAMPLE SEALED YES/NO ________ TIME ________ SEALER

COC COMPLETED YES/NO 1600 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc TIME ______ LAR NO. ______ COMPLETED BY

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WAREHOUSE SOIL SAMPLING

SERIAL NO. GS ______
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. BS-5
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE 06/29/87 SAMPLERS T. Fuhrhop/E.Ahlgren

SAMPLING METHOD 2' Split spoon sampler.
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
1	BS-5	0930	1000 ml jar	Gravel fill material- some
				clay; visible red oil on sample.

Duplicate EPA sample.

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	7.0-10.0 Below	Below concrete, on sample and in
		Concrete	workspace.
		120-300 Sample	
		.5-1.0 Workspace	

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1600 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

SERIAL NO. GS______
PAGE 1 OF 1

WAREHOUSE SOIL SAMPLING

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. BS-6
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE June 29, 1987 SAMPLERS T. Fuhrhop/E. Ahlgren

SAMPLING METHOD 2' Split Spoon Sampler
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
1	BS-6	0800	1000 ml jar	Green gray silty clay

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	200-400 Below	Below concrete, on sample and in
		concrete	work space
		6-10 Work Space	
		70-100 Sample	

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1100 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME _____ LAR NO. _____ COMPLETED BY

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WAREHOUSE SOIL SAMPLING

SERIAL NO. GS______
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. BS-7
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE June 29, 1987 SAMPLERS T. Fuhrhop/E. Ahlgren

SAMPLING METHOD 2' Split Spoon Sample
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
1	BS-7	0735	1000 ml jar	Green gray Silty Clay

* Duplicate EPA Sample

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	.5-1.5 Below	Below concrete, on sample and in
		concrete	work space
		N/A Sample	
		0 Work Space	

DOCUMENTATION

SAMPLE SEALED YES/NO ______ TIME ______ SEALER

COC COMPLETED YES/NO 1600 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ______ LAR NO. ______ COMPLETED BY

mathes

WAREHOUSE SOIL SAMPLING

SERIAL NO. GS
PAGE 1 OF 1

PROJECT NAME Rose Chemical SAMPLE LOCATION NO. BS-8
PROJECT NO. 12872844 MAJOR TASK 2331 SUBTASK -
DATE June 29, 1987 SAMPLERS T. Fuhrhop/E. Ahlgren

SAMPLING METHOD 2' Split Spoon Sampler
TYPE OF SAMPLE: DUPLICATE ___ GRAB ___ BACKGROUND ___ COMPOSITE X
REASON FOR COLLECTION: LAB ANALYSIS X HEADSPACE ___ PHYSICAL TESTING ___

SAMPLE NO.	SAMPLE LABEL NO.	TIME COLLECTED	VOLUME COLLECTED	SAMPLE DESCRIPTION
* 1	BS-8	1400	1000 ml jar	Medium brown sand over brown
				silty sandy clay

* Duplicate EPA Sample

INSTRUMENT READINGS

TYPE OF INSTRUMENT	SERIAL NO.	ACTUAL READING/ CONCENTRATION	LOCATION OF READING
OVA	50323	1000+ Sample hole	Sample hole, work space and on
		0 Work Space	sample.
		300 Sample	

DOCUMENTATION

SAMPLE SEALED YES NO ___ TIME ___ SEALER

COC COMPLETED YES NO 1600 TIME N/A COC NO. TEF COMPLETED BY

LAB ANALYSIS REQUEST COMPLETED On Coc. TIME ___ LAR NO. ___ COMPLETED BY

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX I

Neponset Geophysical Report
Mathes Geophysical Data

JULY/87/0083s

LANGSTON LABORATORIES, INC.
Research • Testing • Problem Solving
2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 29, 1987 (5:00 pm)
COMPLETED: July 10, 1987

LLI NO.: 87-2808
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-8	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	16.0 mg/kg
	1,1-Dichloroethane	2.8 mg/kg
	1,2-Dichloroethene (total)	410 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	16.0 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	110 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 28-29, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
BS-8	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	2.7 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	49 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	0.90 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	1.5 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	0.42 mg/kg
	Aroclor 1260	0.47 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 16, 1987 (2:45 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2679
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB1-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Sample collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB1-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
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ATTN: Jeffrey D. Young

RECEIVED: June 16, 1987 (2:45 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2679
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB1-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. [illegible]rhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB1-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

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Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 16, 1987 (2:45 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2679
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB2-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB2-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

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ATTN: Jeffrey D. Young

RECEIVED: June 16, 1987 (2:45 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2679
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB2-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESC[illegible]TION: Soil Samples Collected from Rose C[illegible]cal, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB2-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 216 Holden, MO 64040	RECEIVED: COMPLETED:	June 16, 1987 (2:45 pm) June 23, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2679 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB3-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samp. Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB3-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 16, 1987 (2:45 pm)
COMPLETED: June 23, 1987
LLI NO.: 87-2679
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB3-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB3-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 10, 1987 (5:20 pm)
COMPLETED: June 22, 1987

LLI NO.: 87-2636
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB4-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB4-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 10, 1987 (5:20 pm)
COMPLETED: June 22, 1987

LLI NO.: 87-2636
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB4-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB4-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 216 Holden, MO 64040	RECEIVED:	June 10, 1987 (5:20 pm)
		COMPLETED:	June 22, 1987
ATTN:	Jeffrey D. Young	LLI NO.:	87-2636
		PROJECT NO.:	12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB5-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB5-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
Research • Testing • Problem Solving
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 10, 1987 (5:20 pm)
COMPLETED: June 22, 1987

LLI NO.: 87-2636
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB5-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

AMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB5-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 23, 1987 (4:40 pm)
COMPLETED: July 6, 1987

LLI NO.: 87-2760
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB6-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB6-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	1.7 mg/kg
	Aroclor 1260	12.0 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 23, 1987 (4:40 pm)
COMPLETED: July 6, 1987
LLI NO.: 87-2760
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB6-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB6-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236

ATTN: Jeffrey D. Young

RECEIVED: June 22, 1987 (4:30 pm)
COMPLETED: June 30, 1987

LLI NO.: 87-2744
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB7-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB7-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	170 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. 210 W. Sandbank Road Columbia, IL 62236	RECEIVED: COMPLETED:	June 22, 1987 (4:30 pm) June 30, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2744 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB7-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB7-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	8.4 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 23, 1987 (4:40 pm)
COMPLETED: July 6, 1987
LLI NO.: 87-2760
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB8-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB8-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 23, 1987 (4:40 pm)
COMPLETED: July 6, 1987

LLI NO.: 87-2760
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB8-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB8-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 23, 1987 (4:40 pm)
COMPLETED: July 6, 1987

LLI NO.: 87-2760
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB8-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB8-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 216 Holden, MO 64040	RECEIVED: COMPLETED:	June 15, 1987 (5:00 pm) June 23, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2669 12872844

SAMPLE DESCRIPTION: **Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop**

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB9-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB9-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
Research • Testing • Problem Solving
2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 15, 1987 (5:00 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2669
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB9-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collecte rom Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB9-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB10-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemica[illegible] [illegible]olden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB10-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB10-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236

ATTN: Jeffrey D. Young

RECEIVED: June 23, 1987 (4:40 pm)
COMPLETED: July 6, 1987

LLI NO.: 87-2760
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: **Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop**

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB11-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
S11-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	0.46 mg/kg
	Aroclor 1260	2.2 mg/kg

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	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

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	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB12-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB12-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	57 mg/kg
	Aroclor 1260	32 mg/kg

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	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB12-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 16, 1987 (2:45 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2679
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB13-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas L. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB13-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB13-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB13-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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SB13-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
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APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB13-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
Research • Testing • Problem Solving

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 216 Holden, MO 64040	RECEIVED: COMPLETED:	June 18, 1987 (10:00 am) June 23, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2708 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB14-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB14-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040

ATTN: Jeffrey D. Young

RECEIVED: June 18, 1987 (10:00 am)
COMPLETED: June 23, 1987

LLI NO.: 87-2708
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB14-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Coll·cted from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB14-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 22, 1987 (4:30 pm)
COMPLETED: June 30, 1987

LLI NO.: 87-2744
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB15-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB15-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.

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2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236

ATTN: Jeffrey D. Young

RECEIVED: June 22, 1987 (4:30 pm)
COMPLETED: June 30, 1987

LLI NO.: 87-2744
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB15-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB15-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 22, 1987 (4:30 pm)
COMPLETED: June 30, 1987

LLI NO.: 87-2744
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB16-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fun..t .p

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB16-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	1.9 mg/kg
	Aroclor 1260	0.70 mg/kg

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2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. 210 W. Sandbank Road Columbia, IL 62236	RECEIVED: COMPLETED:	June 22, 1987 (4:30 pm) June 30, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2744 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB16-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB16-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 15, 1987 (5:00 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2669
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from F Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 15, 1987 (5:00 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2669
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: *Alan Kerschen*
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 216 Holden, MO 64040	RECEIVED: COMPLETED:	June 15, 1987 (5:00 pm) June 23, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2669 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: *Alan Kerschen*
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 15, 1987 (5:00 pm)
COMPLETED: June 23, 1987
LLI NO.: 87-2669
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-4	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-4	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040

ATTN: Jeffrey D. Young

RECEIVED: June 15, 1987 (5:00 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2669
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-5	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 15, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB2-5	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236

ATTN: Jeffrey D. Young

RECEIVED: June 23, 1987 (4:40 pm)
COMPLETED: July 6, 1987

LLI NO.: 87-2760
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB18-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB18-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 23, 1987 (4:40 pm)
COMPLETED: July 6, 1987

LLI NO.: 87-2760
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB18-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 23, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB18-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 18, 1987 (10:00 am)
COMPLETED: June 23, 1987

LLI NO.: 87-2708
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB19-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB19-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 216 Holden, MO 64040	RECEIVED: COMPLETED:	June 18, 1987 (10:00 am) June 23, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2708 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB19-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Scil ..ples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB19-ID	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 18, 1987 (10:00 am)
COMPLETED: June 23, 1987

LLI NO.: 87-2708
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB19-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: [signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected fr. . Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB19-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 9, 1987 (4:45 pm)
COMPLETED: June 22, 1987

LLI NO.: 87-2610
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 9, 1987 by Jeffrey D. Young

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB3-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 9, 1987 by Jeffrey D. Young

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB3-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 9, 1987 (4:45 pm)
COMPLETED: June 22, 1987

LLI NO.: 87-2610
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 9, 1987 by Jeffrey D. Young

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB3-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 9, 1987 by Jeffrey D. Young

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB3-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 9, 1987 (4:45 pm)
COMPLETED: June 22, 1987

LLI NO.: 87-2610
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 9, 1987 by Jeffrey D. Young

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB3-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 9, 1987 by Jeffrey D. Young

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB3-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 18, 1987 (10:00 am)
COMPLETED: June 23, 1987

LLI NO.: 87-2708
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Euhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB21-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB21-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O, Box 216 Holden, MO 64040	RECEIVED: COMPLETED:	June 18, 1987 (10:00 am) June 23, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2708 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB21-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESC[illegible]TION: Soil Samples Collected from Rose Chem[illegible]., Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB21-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 216 Holden, MO 64040	RECEIVED: COMPLETED:	June 18, 1987 (10:00 am) June 23, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2708 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB22-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 1[illegible] 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB22-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 18, 1987 (10:00 am)
COMPLETED: June 23, 1987

LLI NO.: 87-2708
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB22-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 17, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB22-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. 210 W. Sandbank Road Columbia, IL 62236	RECEIVED: COMPLETED:	June 22, 1987 (4:30 pm) June 30, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2744 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB23-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB23-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 22, 1987 (4:30 pm)
COMPLETED: June 30, 1987

LLI NO.: 87-2744
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB23-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB23-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: June 22, 1987 (4:30 pm)
COMPLETED: June 30, 1987

LLI NO.: 87-2744
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB23-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 22, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB23-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 16, 1987 (2:45 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2679
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB24-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB24-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 16, 1987 (2:45 pm)
COMPLETED: June 23, 1987

LLI NO.: 87-2679
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB24-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 16, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
SB24-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 216 Holden, MO 64040	RECEIVED: COMPLETED:	June 10, 1987 (5:20 pm) June 22, 1987
ATTN:	Jeffrey D. Young	LLI NO.: PROJECT NO.:	87-2636 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB1-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB1-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 10, 1987 (5:20 pm)
COMPLETED: June 22, 1987

LLI NO.: 87-2636
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB1-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB1-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
Research • Testing • Problem Solving
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
P. O. Box 216
Holden, MO 64040
ATTN: Jeffrey D. Young

RECEIVED: June 10, 1987 (5:20 pm)
COMPLETED: June 22, 1987
LLI NO.: 87-2636
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB1-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO on June 10, 1987 by Thomas E. Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
TB1-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

LANGSTON LABORATORIES, INC.
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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: July 7, 1987 (4:35 pm)
COMPLETED: July 10, 1987

LLI NO.: 87-2883
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW-101	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW-101	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 µg/liter

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: July 7, 1987 (4:35 pm)
COMPLETED: July 10, 1987

LLI NO.: 87-2883
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW-102	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW-102	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 μg/liter

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
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ATTN: Jeffrey D. Young

RECEIVED: July 7, 1987 (4:35 pm)
COMPLETED: July 10, 1987
LLI NO.: 87-2883
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW-103	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW-103	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 μg/liter

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: July 2, 1987 (9:15 am)
COMPLETED: July 10, 1987
LLI NO.: 87-2837
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 1, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW 202	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 1, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW 202	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 μg/liter

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LABORATORY REPORT

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RECEIVED: July 2, 1987 (9:15 am)
COMPLETED: July 10, 1987

LLI NO.: 87-2837
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 1, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW 203	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED: Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 1, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW 203	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 µg/liter

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236

ATTN: Jeffrey D. Young

RECEIVED: July 2, 1987 (9:15 am)
COMPLETED: July 10, 1987

LLI NO.: 87-2837
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 1, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW 252	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED: Alan Kerschen

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 1, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
MW 252	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 μg/liter

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.
210 W. Sandbank Road
Columbia, IL 62236
ATTN: Jeffrey D. Young

RECEIVED: July 2, 1987 (9:15 am)
COMPLETED: July 10, 1987

LLI NO.: 87-2837
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 1, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
Blank	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED: Alan Kerschen
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO on July 1, 1987 by Thomas Fuhrhop

SAMPLE IDENTIFICATION	ANALYSIS	RESULTS
Blank	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 µg/liter

GROUNDWATER MONITORING WELL DEVELOPMENT AND SAMPLING PROCEDURES

1. Using a pre-cleaned water level indicator, the water level in the well is determined, then the fluid volume of the well is calculated.

2. From the Well Development and Purging General Data Form, the volume of water in the saturated gravel pack is determined.

3. Using a precleaned, five-foot-long PVC bailer, the removal of water begins.

4. The wells are bailed "dry". Water quality readings (pH, temperature, and conductivity) are taken at several increments during the water removal.

5. The above process is repeated twice using the PVC bailer. This same process is then performed using a precleaned Teflon bailer.

6. After one volume has been removed with the Teflon bailer, the well is ready to sample.

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX K

Sampling Procedures

JULY/87/0083s

7. Using suitable lab jars provided by Langston Labs, samples were collected. Two 40 mL VOA vials and one 1000 mL jars were filled from each well. These samples were then chilled on ice and shipped later the same day to the laboratory under chain-of-custody.

8. At the time of sample collection, two final measurements of water quality parameters were taken.

9. Following the sampling procedures, all tools and instruments were thoroughly decontaminated.

10. Decontamination prior, during, and subsequent to this process was accomplished by an Alconox wash, triple rinse with potable water and final rise with deionized water.

WAREHOUSE SHALLOW SOIL SAMPLING PROCEDURES

1. Locate sample point previously located and identified.

2. Using precleaned jack-hammer points and an electric jack-hammer, break through approximately six inch thick concrete floor slab. Scan hole with an OVA for total hydrocarbon vapors.

3. A precleaned split spoon sample, 12-inches in diameter, is driven to a depth of approximately 2.5 feet below top of concrete. The area is again scanned with the OVA.

4. Split spoon is pulled from the hole with the use of a fork lift (provided by Clean Sites). The hole is again scanned by an OVA.

5. The spoon is opened and the sample is put into a precleaned stainless steel bowl. This sample is scanned with the OVA, composited and placed in suitable lab jars provided by Langston Labs and the EPA.

6. All tools are deconned and moved to the next sampling point. The concrete is restored to its original condition with premix bag concrete.

SHALLOW MONITORING WELL INSTALLATIONS

1. Set-up rig at predetermined well location.

2. Using precleaned 4 1/4 inch I.D. hollow stemmed augers and a center plug, the hole is drilled to auger refusal (depth of approximately 15 to 20 feet).

3. The center plug and AW rods are then pulled out of the augers and a precleaned two inch diameter PVC monitoring well is set inside the auger string. The amount of screen (machine slotted, .010 slot width) and riser (flush coupled, screw jointed) is dependant on the depth drilled.

4. Once the well screen and riser are in place, WB40 sand is very slowly poured into the augers. While this sand is being poured, the augers are pulled out of the boring. A weighted measuring tape is used to measure the amount of sand being poured into the augers and the rate the augers are being pulled up is regulated. The sand is placed at least two feet above the top of the well screen.

5. Once the correct amount of sand is in the borehole, a seal of bentonite pellets is installed. This pellet seal is installed using the same method by which the gravel pack is installed. The pellets are then 'activated' using five gallons of potable water.

6. After the pellet seal is in place and activated, the remainder of the augers are pulled from the hole (approximately five feet). The remaining open hole is then backfilled with bentonite/Portland grout to a depth of approximately 1.5 feet below ground surface.

7. Once the grout is in place, a five-inch-diamter, four-foot-long steel well protector is set over the PVC riser. The bottom of this protector extends down into the grout mix.

8. After the grout has sufficient time to solidify, premix concrete mix is poured into the remaining open borehole until level with the ground surface.

9. The well protector is then painted a bright red color for visibility. The well number is placed inside the locked protector.

DEEP GROUNDWATER MONITORING WELL INSTALLATION

1. Set-up rig on predetermined well location.

2. Using precleaned 4.25-inch I.D. hollow stemmed augers and a four-diameter, 5.5 foot long Dietrich Drilling Company Tube System, the boring is advanced to auger refusal (approximately 2 feet into rock).

3. Four-inch-I.D. schedule 40 PVC casing is placed in the borehole (capped top and bottom). This casing is sealed with a Portland cement/bentonite powder grout mixture. This casing is set to prevent possible downward migration of potential contaminants from the soils into the bedrock.

4. After the grout around the casing is allowed to set-up, the rock below is cored using precleaned NX wireline to approximately 50 feet. The core is removed, logged, and stored on-site.

5. After the NX wireline rods are pulled from the borehole, the boring is reamed with a precleaned 3-7/8 inch roller bit. The borehole is then reamed to a depth of 50 feet.

6. Once the borehole remains open, the roller bit and rods are pulled from the borehole, the borehole is geophysically logged, and the precleaned two-inch PVC riser and screen are set into place.

7. Once the riser and screen are in place, a gravel pack consisting of WB40 filter gravel is placed around the screen and at least two feet above the top of the screen.

8. After the gravel pack is in place, a seal consisting of bentonite pellets is installed.

9. Once these pellets have been given sufficient time to activate and seal off the borehole, a Portland cement/bentonite powder grout mixture is pumped into the open hole. This grout was pumped in using of a grout hose to insure a good seal from the top of the bentonite seal to approximately 1.5 feet below ground surface.

10. A locking 4 inch by five foot well protector is then placed over the PVC well. The bottom of this protector reaches down into the soft grout.

11. After the grout has hardened, premix concrete is placed in the open borehole and brought up to ground surface.

12. The well protector is then painted with a bright red paint for visibility. The protector is also labeled with the correct well identification number.

SLUG TEST PROCEDURES

1. Measure water level and total depth of the well to be tested.

2. Measure desired length of rope and tie to prelceaned slug (6' x 1" PVC pipe).

3. Drop slug into well.

4. Using an Electronic Water Level Indicator, begin taking water levels immediately after placement of slug into the well.

5. Measure water levels at 15 seond intervals for approximately the first five minutes of the test. Measurements are then taken on 30 second intervals, one minute intervals, 5 minute intervals, etc., depending on recovery rate of the well.

6. Once well has recovered, pull slug out of well.

7. Using an electronic Water Level Indicator, begin taking water levels immediately after removal of slug from well. Take water levels using above described method and time intervals.

8. Once well is recovered, repeat above process.

9. Test is complete once slug-in/slug-out procedure has been performed twice successfully.

BAIL-DOWN RECOVERY TEST PROCEDURES

1. Measure water level and total depth of well to be tested.

2. Measure out and cut desired length of rope and tie to a precleaned PVC bailer.

3. Using the bailer, remove water from the well until there is approximately 2' remaining in well.

4. Remove bailer from the well.

5. Using an electronic water level indicator, begin taking water levels immediately after removal of the bailer.

6. Take water levels at 15 second intervals for approximately the first five minutes of the test. Measurements are then taken on 30 second intervals, one minute intervals, five minute intervals, etc., depending on recovery rate of the well.

7. Once recovery has greatly slowed, water levels are taken at convenient intervals until well is recovered.

ROSE CHEMICAL
PRELIMINARY SITE ASSESSMENT REPORT

July 31, 1987

APPENDIX L

Health and Safety Protocol

JULY/87/0083s

1 INTRODUCTION

Health and Safety Protocols were established for all preliminary assessment/site investigation field activities performed by John Mathes & Associates personnel and their sub-contractors. Mathes Protocol were consistent with the Site Safety Plan - Rose Chemicals Site, Holden, Missouri. Prepared for Clean Sites, Inc., by Chemical Waste Management, Inc. - ENRAL Division. The following text summarizes protocols and procedures comprising the Mathes site safety program for Phase I and II field activities.

2 SAFETY ORGANIZATION & AUTHORITY

2.1 On Site

Each field investigation phase had a site health and safety officer and a field activities supervisor. The site supervisor was directly responsible to the health and safety officer for enforcement of site safety protocols.

Phase I - Site Safety Officer and Site Supervisor
A.J. Hoyt

Phase II - Site Safety Officer, Tom Miller
Site Supervisor, Tom Fuhrhop

2.1.1. Off-Site

Safety oversight coordination and authority for all field activities were the responsibility of A.J. Hoyt, Project Safety Officer.

3 SITE CONTROL

3.1 Site Command

Control of site activities and restrictions were performed jointly with Clean Sites, Inc., on-site representatives. Site security and access were under direct authority of Clean Sites, Inc., on-site area restrictions were designated and enforced by Mathes Field authorities. Site command operated from on-site field office trailers.

3.2 Site entry

Site entry was limited to personnel approved by joint Mathes/Clean Sites, Inc., authority. Daily site access was documented by both Clean Sites, Inc. Subcontract security personnel, and Mathes site authority. Mathes personnel or subcontractors, entering restricted site areas or performing activities where exposure to site contaminants was possible, met EPA and OSHA approved medical monitoring and training requirements.

3.3 Site area restrictions

Specific site areas were designated as "restricted" with respect to access, personnel protection, hazard monitoring, and decontamination. Safety protocols were established for each of those areas based on:

1) PCB contamination data available prior to to Mathes activities; and

2) anticipated hazards from specific field investigation activities.

The following summarizes general restrictions applied to site activities:

- o the site surface in general, was considered surface clean for access and non-intrusive activities;
- o the main warehouse interior was considered surface and atmosphere contaminated for all activities;
- o the immediate vicinity of any rig drilling location was considered a restricted area;
- o the areas identified as having significant PCB concentrations within the surface soils were designated exclusion "hot" zones;
- o areas in the immediate proximity of the main warehouse, outdoor chemical product storage tanks;
- o or suspected subsurface disposal locations were considered potentially subsurface soil contaminated;
- o drilling and sampling equipment that contacted any earth or groundwater material known or suspected as contaminated was treated as

contaminated, and decontaminated prior to re-use or unprotected dermal contact; and

- decontamination (contaminant reduction) areas were restricted as dermal contact hazard areas.

3.4 Decontamination

3.4.1. Equipment

Two separate contaminant reduction areas were utilized to decontaminate site investigation equipment. A primary decontamination area was established in the graveled area immediately south of the main warehouse building. The surface ground was protected with plastic sheeting, and used steam cleaner-generated decontamination fluids were collected and containerized to prevent contaminant migration. A secondary decontamination facility was set-up at the southeast entrance to the main warehouse to decontaminate sampling equipment between uses in warehouse sampling. Only wash tubs with brushes, and pump sprayers were used at this location.

Equipment was decontaminated with a detergent wash and potable water rinse. Liquid simple green was used with the steam cleaner. Alconox powder was mixed in wash tubs and pump sprayers for hand-brush cleaning of samples and personnel protective equipment. All spent wash or rinse fluids were disposed of in the on-site storage containers (above ground swimming pools) designated by Clean Sites, Inc.

3.4.2. Personnel

Field personnel, required to wear personnel protective equipment (PPE-clothing or respirators) during field activities, de-suited under the direct supervision of the site safety officer at a designated location adjacent to the work area. Wasted clothing and supplies were drummed at each outdoor drilling/sampling location. Wasted materials from warehouse sampling activities were disposed of in a dumpster located inside the southeast corner of the building, per Clean Sites Inc., instructions. Respirators were bagged during de-suiting, transported to and cleaned at the main equipment decontamination facility.

3.5 Investigation-derived spoils

Drilling and sampling spoils from shallow soil borings were backfilled into the borehole. Drilling and sampling spoils, drilling fluids, and monitoring well development water from all other drilling locations were drummed, identified and left at the drilling location.

4 HAZARD EVALUATION

Site hazard evaluation addressed known or anticipated chemical and physical hazards. Dermal chemical hazards were anticipated for based on analytical data from initial site characterization by Chemical Waste Management, Inc. Respirable chemical hazards were evaluated by air quality monitoring instrumentation. Physical heat stress (body temperature increase), associated with warm weather use of PPE, was monitored and evaluated by the site safety officer. Field work schedules were adjusted accordingly.

5 AIR QUALITY MONITORING PROGRAM

Two air quality instruments, a photoionization detector (PID) and a flameionization detector (FID) were used to measure and monitor ambient air quality during site activities. An HNu model PI-101 PID was used during Phase I activities to survey ambient conditions and contaminant vapors on-site. A foxboro model 128 organic vapor analyzer (OVA) FID was used to establish and monitor appropriate respiratory protection during Phase II drilling and sampling.

Action levels for respiratory protection were:

Instrument Reading	Level of Protection
Above ambient to 5 needle deflection units	Level C
5-500 needle deflection units	Level B

6 PERSONNEL PROTECTIVE EQUIPMENT

6.1 Respiratory protection

Approved respiratory protection equipment were:

Level of Protection	Required Equipment
Level C, no splash hazard	NIOSH/MSHA-approved half-mask respirator with dual organic vapor, acid gas and high efficiency particulate/aerosol (OVAGHEPA) filter cartridges.
Level C, with splash hazard	NIOSH/MSHA-approved full-face respirator with dual OVAGHEPA cartridges.
Level B	NIOSH/MSHA-approved supplied-air full=face respirator system: provided with a positive-pressure, pressure-demand mode; five minute (minimum) escape capability, and approved breathing grade air supply.

Note: Sampling locations within the main warehouse, that initially emitted level B vapor concentrations upon floor slab penetration, were completed under Level C respiratory protection after allowing the work space to ventilate.

6.2 Dermal protection

Required dermal protection was based on the potential for chemical and splash exposure. Phase I protection was, generally, less stringent than Phase II. Requirements due to the survey-oriented nature of activities and a deliberate avoidance of subsurface penetration into "known" contaminated surface soils.

6.2.1. Phase I apparel

Normal field clothing was acceptable for general outdoor site surface work, including grid system layout, and air quality, geophysical and soil gas surveys. Surgical gloves were provided for handling of soil gas probes used in areas suspected of PCB contamination.

Level C, non-splash protection was worn during walk-through inspections of the main warehouse. Dermal protection included PVC-poly coat tyvek coveralls, surgical gloves, latex outer boot covers, a hard hat, safety goggles, and a half-mask respirator.

6.2.2. Phase II apparel

Specific dermal protection requirements were increased during Phase II due to the higher potential for contaminant encounter (during intrusive activities). Maximum site protection was worn for sampling activities within the warehouse, where encounter of waste chemical product was possible.

6.2.2.1 Outdoor borings/sampling

In summary:

- o Level "E" worn in areas where it was surface cleaned and no readings encountered with the OVA; Protection: Cotton coveralls, hardhat, safety goggles, surgical gloves, PVC gauntlet gloves, neoprene steel toed safety boots and latex outlet boot covers.

- o Level "D" worn in areas where Tracer Soil gas had encountered levels of organic volatiles in the soil. These areas were constantly monitored with an OVA. If any increases in needle deflection units over ambient were encountered in the workspace, an upgrade to Level "C" was made;
  Protection: PVC polycoat tyrek coveralls, cotton coveralls, hard hat, safety goggles, surgical gloves, PVC gauntlet gloves, neoprene steel toed safety boots and latex outer boot covers.

- o Level "C" was worn in areas where Tracer Soil gas had encountered high levels or organic volatiles in the soil These areas were constantly monitored with an OVA. If no readings inside the workspace were encountered a downgrade to Level "D" was made.
  Protection: Full face respirator with OVAGHEPA PVC cartridges, polycoat tyrek coveralls, cotton coveralls, hard hat, surgical gloves, PVC gauntlet gloves, neoprene steel toed safety boots and latex outer boot covers.

6.2.2. Warehouse borings/sampling

- o level "C" was worn at all times during sampling activities;
- o level "C" consisted of: saran-coated tyrek coveralls, cotton coveralls, full force respirator with OVAGHEDA cartridges, hard hat, surgical gloves, vitan gloves, neoprene steel toed safety boots and latex outer boot covers;
- o during Jack Hammer activities, an OVA was used to monitor the workspace for emissions from concrete floor slab penetration; and
- o any time readings over five needle deflection units were encountered, operations were ceased and the area was evacuated. After allowing ample time to vent, the area was monitored with an OVA; if readings had dropped below five needle deflection units, the area was reentered.

6.3 Decontamination protection

Splash dermal protection was worn for equipment decontamination with the steam cleaner. Protective apparel included PVC-polycoat tyver coveralls, cotton coveralls, neoprene steel toed safety boots, latex outer boot covers, surgical gloves, nitrile gauntlet gloves,a hard hat and face shield.

7 GENERAL SITE SAFETY PROTOCOLS

Mathes general site safety protocols were consistent with the general safe work practices listed in section 7.0 of the Chemical Waste Management, Inc., prepared Site Safety Plan.

8 CONCLUSIONS

Site communications were maintained between work locations and the command center with portable walkie-talkies. Off-site communications were available with the telephone provided in the Clean Sites, Inc., provided office trailer.

9 EMERGENCY CONTINGENCY PLAN

Mathes personnel were directed to follow the general protocols for emergency response, as provided, and previously posted in the office trailer by Chemical Waste Management, Inc., personnel. Emergency contacts, hospitals, and routes were to be used, as posted. Normal Mathes post-incident contacts and reporting would have been followed, if needed.

10 CONCLUDING CONSIDERATIONS

The health and safety protocols provided herein detail the specific site protocols followed by Mathes field personnel during Phase I and II site investigation activities. This document is not intended to be a site safety plan, but rather, a clarification of actual site protocols and summary of procedures followed for specific Mathes on-site activities. In general, site safety protocol, where not specifically discussed or detailed otherwise in this plan, were followed consistent with the Chemical Waste Management, Inc., prepared site Safety Plan.